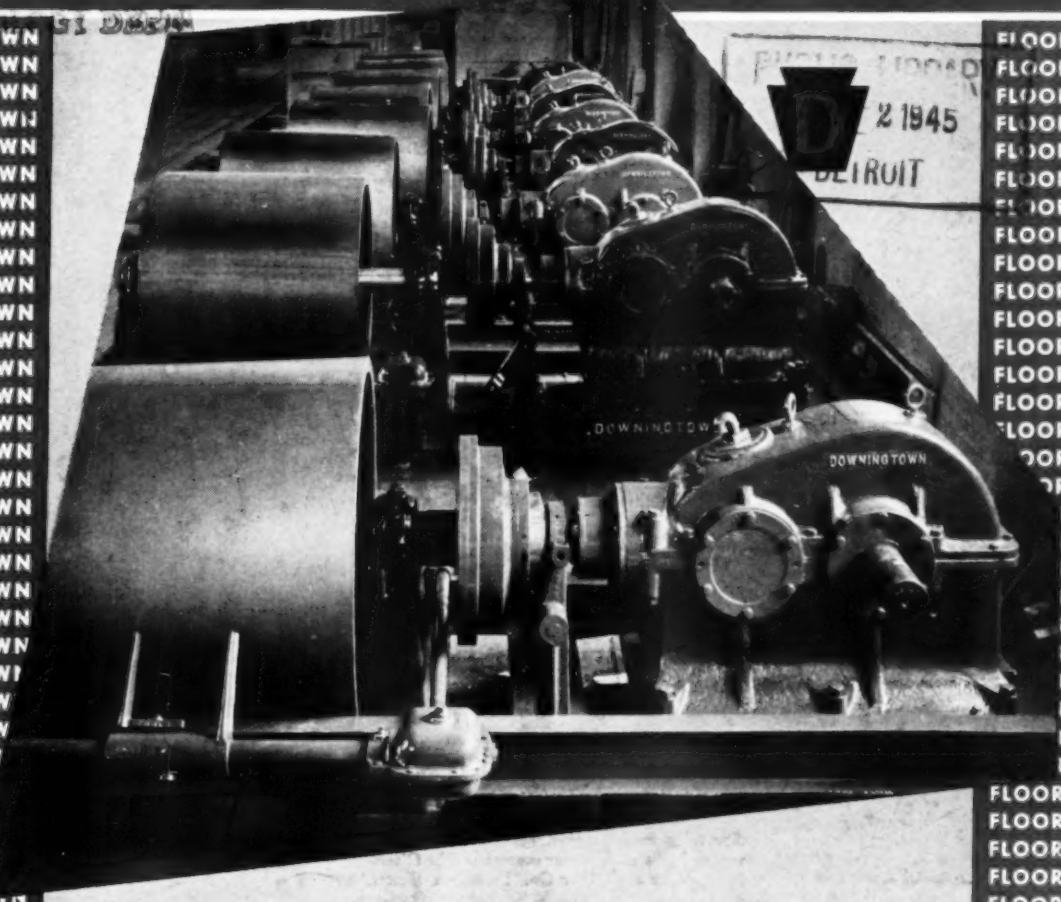
HE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE—MARCH, 1945



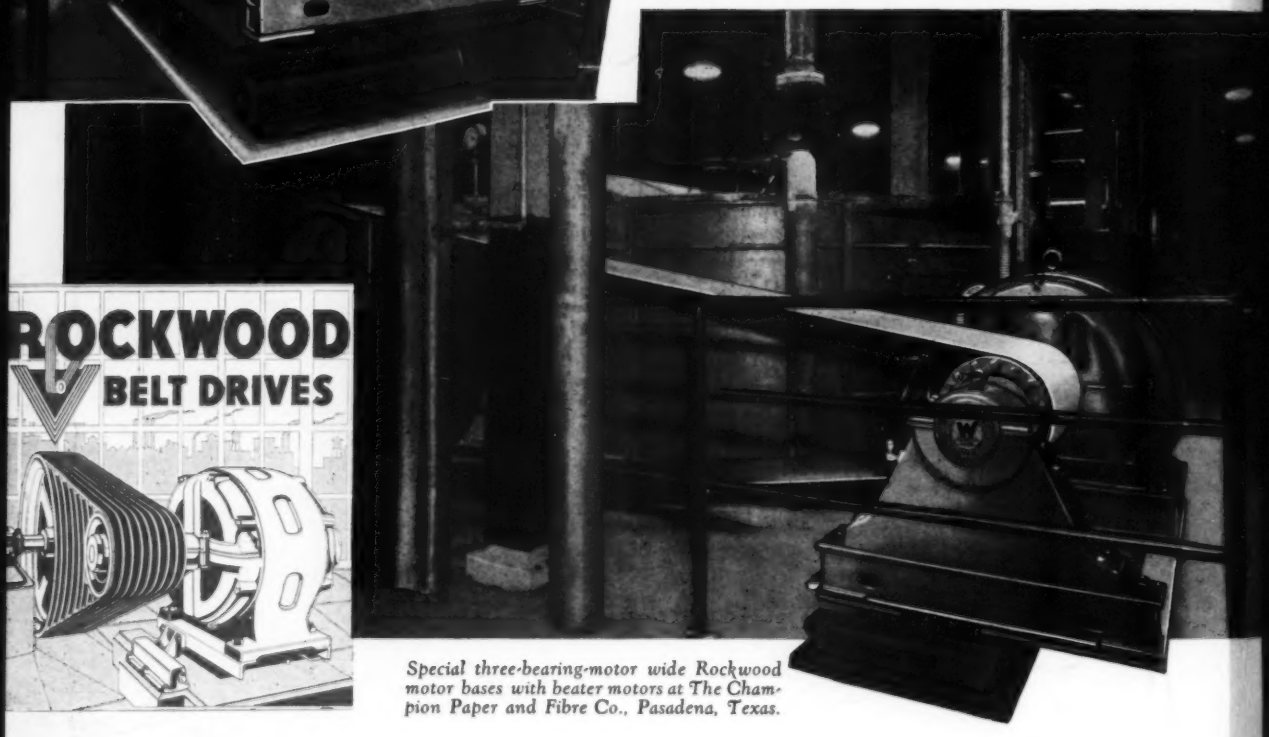
NGTOWN
FLOOR DRIVE

Strain of wartime operation has been hard on many floor drives. If they are badly worn, they can waste a lot of power. Whether you need new ones for this reason, or because your post-war machine modernization calls for higher speeds, remember we make all types and that they are especially designed for paper machines.

DOWNINGTOWN MFG. CO., DOWNINGTOWN, PA.

improve the performance of your beaters AND CUT COSTS

ROCKWOOD automatic belt tightening MOTOR BASES



Special three-bearing-motor wide Rockwood motor bases with beater motors at The Champion Paper and Fibre Co., Pasadena, Texas.

V-belts, too, do better work and last longer with Rockwood Drives. V-belts are subject to the same laws as flat belts. They, too, stretch in service, which elongation causes them to slip — and then to harden and glaze. When V-belts are used with Rockwood automatic tension control bases, they often last twice as long. Use these fine bases with all your V-belt and flat belt drives.

In almost every paper mill where one or more Rockwood Drives are first installed on trial, and plant engineers then take time to carefully check results, the automatic belt tightening motor base soon becomes accepted mill practice. When mill engineers see how simply the Rockwood pivoted motor Drive takes up belt stretch, and how the belt tightness automatically matches each load change, it is obvious why the driven machine operates better and at more dependable speeds.

Belt life—V-belt or flat—is increased, ordinarily doubled. Never before has a belt drive from electric motor to driven machine been so soundly engineered; that is the reason so many paper mill engineers are installing them. Write us about your drives today for better mill operation tomorrow.

ROCKWOOD
INDIANAPOLIS • U.S.A.
Specialists in Power Transmission Equipment Since 1884

NEW TASK, OLD TRADITION
A wartime "whopper," this 78" vertical tank mill designed by Consolidated Machine Tool Co., is one of many built at Beloit. Far more rugged than the standard machine, and with a heavier motor, it is capable of the highest performance on the toughest alloys for tanks. Here you see it being tested in our shop—another wartime emergency assignment typical of those that Beloit craftsmen have taken right in their stride.
Beloit Iron Works, Beloit, Wisconsin
Buy War Bonds for Victory
BELOIT IRON WORKS
PAPER MACHINERY
BELOIT, WIS., U.S.A.
A PAPER MILL IS PART OF EVERY BATTLE
BELOIT
PAPER MACHINERY
WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE!

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 3 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS

Map copyright by L. D. Post, Inc., New York. American Map Co., N. Y.

HIGH LIGHTS:

The earliest paper mill in New Hampshire is believed to have been established at Keene in 1792, but no authentic information regarding it is available.

New Hampshire pioneered in the manufacture of high grade sulphite pulp, and is still a leader in quality, although it has not ranked high on a quantity basis. In the production of paper it ranks 19th, making a variety of papers ranging from tissues to boards. It also contains one of the leading converting plants making gummed and coated papers.

New Hampshire has 30 paper mills and 6 pulp mills; 28 Fourdriniers, 13 cylinder machines and 60 wet machines.

The total paper production in 1939 amounted to 166,211 tons, wrapping and tissue comprised the principal products.

Draper Felts for Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

Canton, Massachusetts

RALPH E. BRIGGS Sales Manager

BRADFORD WEST PITTSFIELD, MASS. • WILLIAM N. CONNOR Jr CANTON, MASS. • L. H. BREYFOGLE KALAMAZOO, MICH. • CHAS. E. BERTSCHY MILWAUKEE, WIS. • W. L. CAMPBELL SAVANNAH, GA. • BALFOUR GUTHRIE & CO. Ltd. PACIFIC COAST

SPEEDING UP mill yard movement

EVEN after the logs are in the yard, a transportation problem still exists . . . and a "Caterpillar" tractor with an ingenious Trackson "Traxcavator" arm attachment offers a speedy and economical way of handling them.

Efficient operation of tractors and trucks, as well as mill machinery, is largely a matter of effective lubrication. Experienced operators use Texaco.

Texaco Marfak, for example, provides a tough, adhesive film that cushions chassis bearings against road shocks and protects them against road splash. This unusual product provides ideal film lubrication inside a bearing, yet maintains its original consistency at the outer edges . . . sealing itself in, sealing out grit and water.

For wheel bearings, use *Texaco Marfak Heavy Duty.* It stays in the bearings — assuring safer braking. No seasonal change is required.

For high-speed ball and roller bearings in electric motors and other equipment, use *Texaco Regal Starfak.*

Texaco lubricants have proved so effective in service they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing plants in the 48 States. The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

★ *More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.*

★ *More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.*

★ *More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.*

★ *More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.*

★ *More revenue airline miles in the U. S. are flown with Texaco than with any other brand.*

TEXACO

TEXACO Lubricants

FOR THE PAPER INDUSTRY

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON SUNDAY NIGHTS ★ METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS

an Old Product

TAKES ON NEW TASKS

Plain, old-fashioned Bicarbonate of Soda is an amazingly versatile chemical product. Household remedy for many common ills . . . key ingredient for dozens of pharmaceuticals . . . basic in baking powder and millers' choice for self-rising flour—"bi-carb" plays its homely, useful roles.

"Bi-carb" is just as essential in hundreds of industrial operations . . . is the active ingredient in several types of fire fighting equipment . . . helps tan leather . . . prevents sap stain in lumber . . . performs importantly in the production of plastics, sponge rubber and in heat-treatment of special steels . . . neutralizes acids and removes caustic.

Through Mathieson Research, "bi-carb" assumes great new importance in the textile industry. Commercially developed, Mathieson's new process for removing caustic with "bi-carb" speeds up production, lowers cost, eliminates acid's disadvantages . . . removes caustic by *changing* it into sodium carbonate (soda ash).

The Mathieson Research and Technical Staffs are also applying "bi-carb" experience to certain phases of the paper industry. Perhaps their accumulated knowledge of "bi-carb's" versatility may hold important meaning for you—may bring to light possibilities you haven't thought of. *Co-operation means progress for all.*

Mathieson
CHEMICALS

THE MATHIESON ALKALI WORKS (INC.) 60 EAST 42nd ST., NEW YORK 17, N. Y.

BICARBONATE OF SODA . . . CAUSTIC SODA . . . SODA ASH . . . LIQUID CHLORINE . . . CHLORINE DIOXIDE
AMMONIA, ANHYDROUS & AQUA . . . . H T H PRODUCTS . . . . FUSED ALKALI PRODUCTS . . . . SYNTHETIC SALT
CAKE . . . . DRY ICE . . . . CARBONIC GAS . . . . SODIUM CHLORITE PRODUCTS . . . . SODIUM METHYLATE

THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

— Serving the Industry Since 1919 —

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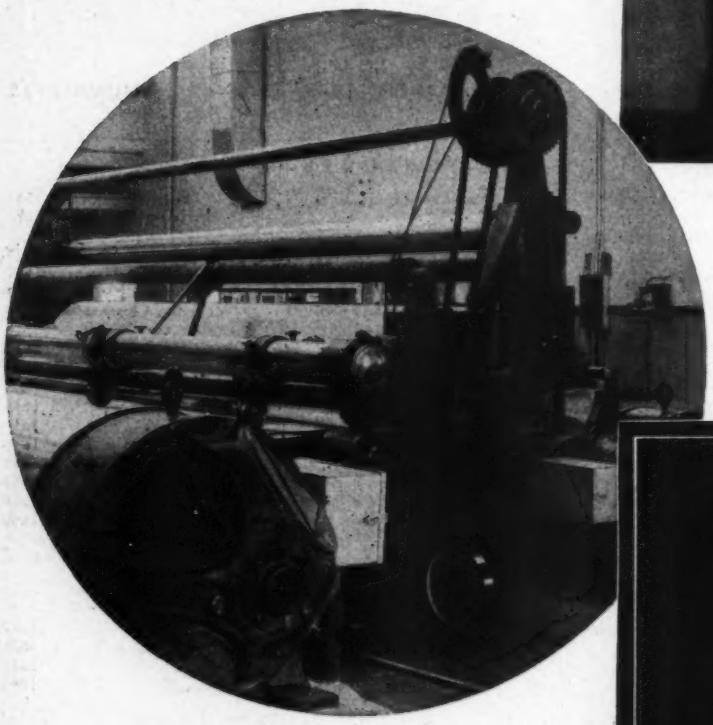
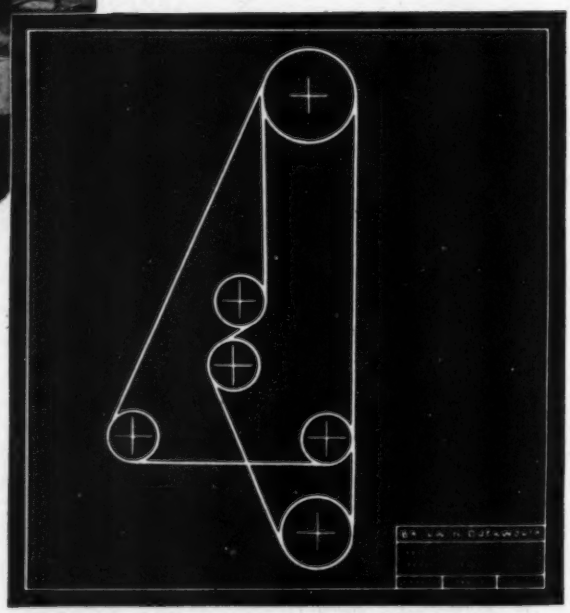
IT TAKES *Smooth Power* FOR SMOOTH PAPER

① SMOOTH, POSITIVE POWER . . . power that doesn't hesitate . . . is a vital necessity in a paper mill. A slip . . . a fraction of a second pause in the flow of power . . . and a torn sheet may result . . . the coating of the paper may be uneven or rough.



② THERE'S A WAY to avoid those "power pauses." Power transmitted by Baldwin-Rex roller chain belts never slips . . . never falters. This finishing machine, for example, takes advantage of the positive grip of Baldwin-Rex chain on sprocket teeth to assure smooth power transmission.

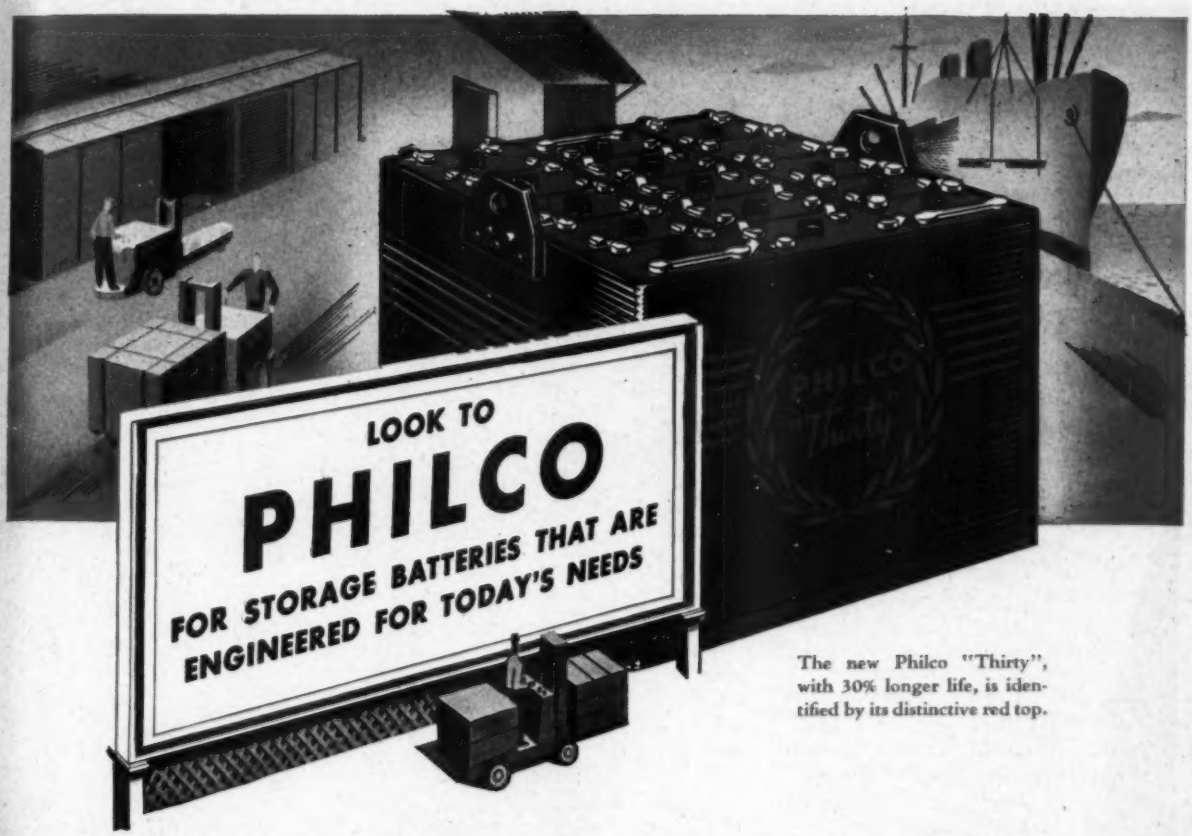


③ LOOK AT THIS DRIVE DESIGN diagram. It shows how Baldwin-Rex transmits smooth-flowing power to the rolls. Baldwin-Rex chain belts are the ideal drive for the paper and pulp industry. They're highly shock absorbent, are not adversely affected by dust or grease, never slip and are equally efficient on long or short centers. Installation is simple.

For catalogs on Baldwin-Rex roller chain belts or competent information on your specific drive problems, write **BALDWIN-DUCKWORTH** *Division of* **CHAIN BELT COMPANY,** *367 Plainfield Street, Springfield 2, Mass., or call your local Baldwin-Rex representative.*

BALDWIN-REX *ROLLER CHAIN BELTS*

Baldwin-Duckworth Division, Springfield 2, Massachusetts • Rex Chain Belt and Transmission Division, Rex Conveyor and Process Equipment Division, Milwaukee 4, Wisconsin

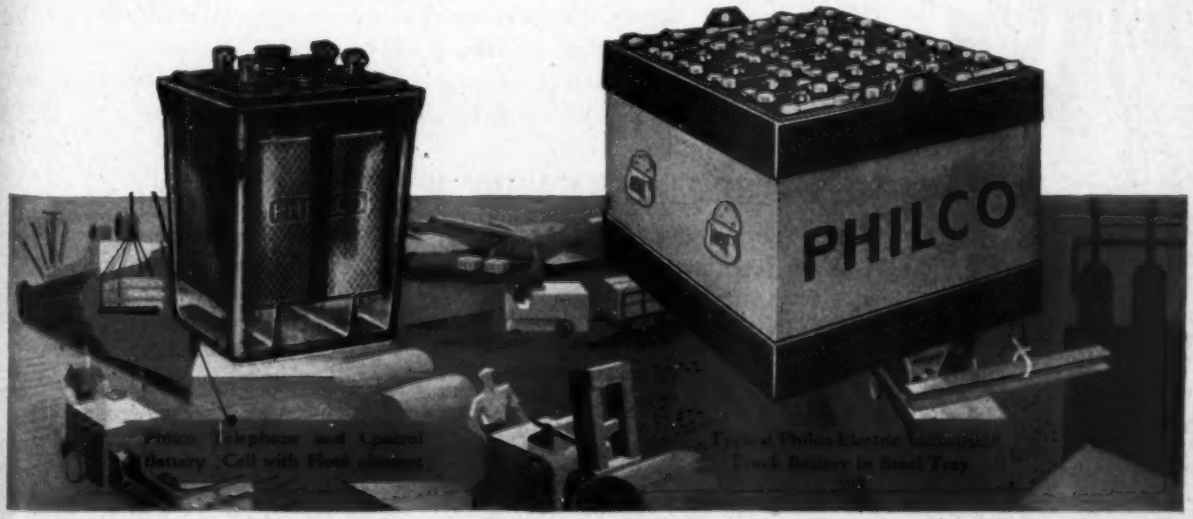


The new Philco "Thirty", with 30% longer life, is identified by its distinctive red top.

Consistently through the years, users of PHILCO Storage Batteries—both motive power and stationary types—have been *first* to get the major developments contributing to high capacity, greater efficiency, longer life, lower cost. Newest Philco *first* in industrial storage battery engineering is the new Philco "Thirty" with *30% longer life*—now available in certain types and limited quantities for electric industrial trucks. Catalogs of this and other modern Philco Batteries for your special needs will gladly be sent on request.

Philco Corporation, *Storage Battery Division,* Trenton 7, New Jersey

For 50 years a leader in Industrial Storage Battery Development



. . THE PACKAGE GOT DELIVERED . . .

Ray Blank is employed by a Cleveland engraving company. He is a trustworthy messenger. How trustworthy you shall see.

Ray had been in the service of his country. At Casablanca and other places in North Africa, he had been in the military police. Put out of action by a truck, he had been honorably discharged.

On October 20, 1944, at 2:35 in the afternoon, Ray Blank was on a delivery trip. Just then, a tank of compressed liquid gas let go; sheeted flame blanketed the neighborhood, and quickly precipitated the worst disaster in Cleveland's history. Ray was caught. They tore his burning clothes off him and hustled him away for treatment.

Army trained, this modern "messenger to Garcia" held on to his package. That was his responsibility. It didn't belong to him. Consequently, a full and immediate report was due its owner. And the report had to go through. Period.

Arriving at the hospital, Ray asked that the whereabouts of himself and his package be telephoned to his company. Nothing happened. Ray insisted. He kept insisting until the doctor, impressed if amused, granted his patient's request. Next day, Ray's employers picked up the package and delivered it.

Ray Blank is still on the job. His head is still bandaged; some of the hair will never grow back. To many of us this is a badge of faithfulness which stands for duty well done.

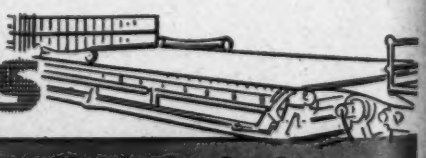
Responsibility

Do we need to enlarge tediously on so simple a narrative? This country of ours is in a greater hurry than ever before in its history. Every day, every man and woman of us helps or hinders that speed with every movement we make. If any one of us lags for an instant in any department in any organization in any branch of industry, that lag carries through to front lines where our sons are dying for lack of the things they need.

THE LINDSAY WIRE WEAVING COMPANY

Serving the Paper Industry Since 1903

14001-14299 ASPINWALL AVENUE • CLEVELAND 10, OHIO



Lindsay **WIRES**

FOR PAPER MILLS

Why is FALK a good name in industry?

A business institution acquires a fine reputation, not because of its size, not because of the dividends it pays, not because of the patents it holds; but because of the acceptance of its products and methods of doing business by prospects, by customers, and by its employes.

For over fifty years prospective customers for Falk products have been gracious in their acceptance of Falk representatives.

Actual customers have purchased and repurchased Falk products year after year.

Falk employes are proud to be associated with the Falk Corporation, and verify their pride by many years of service.

This is evidenced by the Navy's acceptance of Falk products since before World War I; by the attitude of the Falk management toward Falk employes during the lean years of the economic cycle; by the honors bestowed upon Falk officials; by recognition of the high standards of its employe relations accorded by a national magazine; and by interplant and office activities of the employes themselves.

It has long been an axiom of the Falk management that "to build a better product, first improve the man." Falk quality is due in no small measure to the thoroughness of Falk apprenticeship courses.

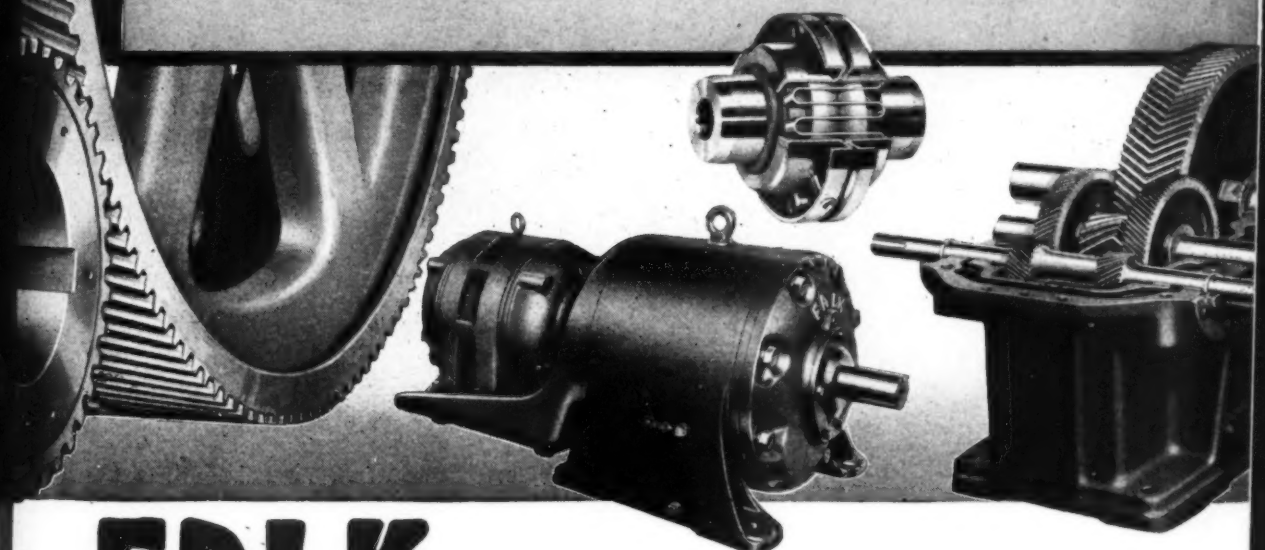
The same thoroughness employed in molding men is employed in molding Falk material. Falk casts its own steel in its own foundry to its own specifications.

To secure the watch-like precision so characteristic of all that Falk produces, it has always been the Falk policy to design its own machinery.

Because Falk has always known its men, its material, and its tools, it logically follows that Falk engineering has always been better than it could have been, had this engineering been done with unknown components.

All of this is just plain good business. No reputation can ever be acquired, much less maintained, unless it is based on plain good business. For plain good business is business that is good first for the customer, then for the employe, then for the corporation—and only then for the management.

This is why Falk is "a good name in industry".



FALK...A GOOD NAME IN INDUSTRY

THE FALK CORPORATION, MILWAUKEE 8 WISCONSIN

District Offices, Representatives, or Distributors in principal cities

Announcing:

KELGIN LV

A sizing material that is simple to use and uniform in quality.

KELGIN LV dissolves readily in hot or cold water and is adapted to water box application on the calender stacks.

We suggest you try KELGIN LV for gloss ink sizing and for the preparation of paper board to receive wax coatings.

KELGIN LV is available. Your inquiries will receive our careful attention and our Technical Department is ready to extend service in commercial applications.

KELCO COMPANY

75 E. Wacker Drive
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31 Nassau Street
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530 W. Sixth Street
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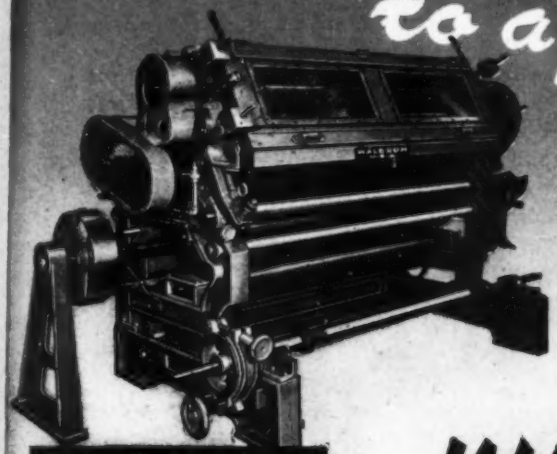
What's 1/10,000 of an inch to a paper maker?



Waldron Horizontal Reverse Roll Coating Machine

IT'S ENOUGH TO JUSTIFY HIS PREFERENCE FOR

WALDRON COATERS

Among Prominent Users of Waldron Coaters are:

American Coated Paper Corp.
American Coating Mills
Appleton Coated Paper Co.
Champion Coated Paper Co.
Consolidated Paper Co.
Hampden Glazed Paper Co.
Holyoke Card & Paper Co.
Martin Cantine Co.
Nashua Gummed & Coated Paper Co.
National Folding Box Co.
Standard Coated Products Co.
And many others.

Coatings metered to one-ten-thousandths of an inch can be secured only with rolls ground as fine as those provided in the Waldron Coating Machines. It is not surprising that experienced paper makers use more Waldron Coaters than any other make.

They know what it takes to assure that solid, smooth uniform quality of coating that Waldron Coaters consistently produce. Made in Knife, Combination Roll and Knife, Roll and Reverse Roll types. Full particulars will be sent on request.

WATCH . . . for the new Waldron Micro-Jet Coater (patents pending) soon to be announced . . . a major advance that will speed up production of coated paper. *When there's better cotaing it will be done on Waldron Machines.*

Aniline Printing Machines
Combining Machines
Creping Machines
Floor Covering Machines
Gumming Machines
Rubber Mill Machines
Wall Paper Printing
Waxing Machines
Winders and Slitters
Special Design Machines

JOHN WALDRON CORPORATION
Main Office & Works — NEW BRUNSWICK, N. J.

WALDRON
Paper Converting Machinery

ELEVATED STORAGE PROVIDES A 3-Way SERVICE AT A SULPHITE PAPER MILL

Pulp mills use Horton elevated water storage for several distinct types of service. Three typical examples are illustrated here. All of these tanks were designed and fabricated at our plants and erected by one of our field crews at a sulphite pulp mill in the South.

• *Left*—FOR FIRE PROTECTION. *The Horton elevated tank shown at the left is used at this mill to provide a reserve of water for fire protection. It holds 100,000 gals. and is 150 ft. to bottom.*

• *Below* — AT WATER TREATING PLANT. *The 100,000-gal. Horton tank shown below is used to store sea water obtained from a nearby tidal river. The tank floats on the sea water line behind filters to maintain a constant pressure to various softening units as well as to handle their demands.*

• *Right* — FOR GENERAL SERVICE. *This Horton elevated tank provides gravity pressure on the treated water supply for the various processes at the mill. It holds 100,000 gals. and is 100 ft. to bottom.*

NOW IS THE TIME TO MODERNIZE YOUR MILL WITH ELEVATED STORAGE. WRITE OUR NEAREST OFFICE.

CHICAGO BRIDGE & IRON COMPANY

Chicago, 4.....2445 McCormick Building
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Cleveland, 15.....2267 Guildhall Building
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Birmingham, 1.....1511 North 50th Street

Tulsa, 3.....1651 Hunt Building
Houston, 1.....5643 Clinton Drive
Philadelphia, 3.....1653-1700 Walnut Street Building
Washington, 4.....703 Atlantic Building
San Francisco, 5.....1017 Rialto Building

Plants at BIRMINGHAM, CHICAGO and GREENVILLE, PENNA.

In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

DIAMOND

INDISPENSABLE PRODUCTS *in* PAPER AND PULP PROCESSING

Caustic Soda
Liquid Chlorine
Silicate of Soda
Soda Ash

ALKALI

DIAMOND ALKALI COMPANY

PITTSBURGH, PA., *and Everywhere*

ALKALIES

Today many churches, schools and other groups collecting wastepaper are using the money derived to benefit children, the sick, the aged, the underprivileged or other worthy local projects, in literally scores of ways.

Now, in addition to these, it is suggested that the needs of our wounded veterans provide another great cause which may well take its place with all the rest now being served by the soldiers of salvage!

Paper Situation Critical. . . Last year we collected 7,000,000 tons of wastepaper. This was a good job, but the need remains urgent. Paper is *still* the No. 1 war material shortage.

The amount of paper available for collection is constantly lessening. Yet we are asked to collect even *more* in 1945 if we are to meet the needs of our fighting men, as well as essential home front requirements.

Veterans Aid Optional. . . All wastepaper funds have been and will be locally raised and locally spent. The use to be made of the money is always up to the organizations concerned.

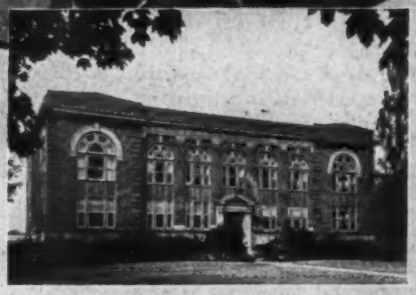
However, many have already seen fit to apportion all or part of their wastepaper money to nearby veterans hospitals to give our returning wounded the "home comforts" they might not otherwise enjoy. Such things as radio-phonograph combinations, sound movie projectors, records, settees, lounge chairs, sun porch equipment, tables, cigarettes, phone calls home and the like. These are the little "extras" . . . little but so important . . . which will supplement the necessities, all of which are provided by the Government.

A Double Opportunity. . . Many patriotic organizations have already realized that the need for wastepaper is rising as the war reaches a new pitch of intensity . . . and that another human need is also rising . . . the need for extra little attentions for the men who have given so much, a small assurance to them that they *have not been forgotten!* Armed with this new reason for saving wastepaper, let every boy and girl, every Boy Scout and Paper Trooper, every mother, wife or sweetheart with a service star in the window, pledge renewed effort . . . to assure that the Double V Wastepaper Program will exert a mighty force in the drive to Victory!

U. S. Victory Waste Paper Campaign

TRADE WINDS

Sale of Bryant Paper Company Reflects "The March of Time"



GENERAL OFFICES

▶▶▶ A HISTORY-MAKING transaction was consummated in Kalamazoo, Michigan, on March 1, when the stockholders of the Bryant Paper Company approved the sale of that company to Time, Inc. The sale figured approximately $2,300,000. The Bryant company thus becomes a wholly-owned subsidiary of the New York firm, publisher of the four national magazines: *Time*, *Life*, *Fortune*, and *The Architectural Forum*.

The transaction has been consummated with the understanding that Time, Inc., will take only that part of Bryant's production which can be sold "without sacrificing any of the old company's present customer relationships."

The Bryant name will be retained by the purchaser, and officers of the former Bryant Paper Company will remain in charge.

Sales of the Bryant Paper Company to Time, Inc., is peculiar in that it is the first time in the long history of papermaking in the Kalamazoo River valley that a valley mill has passed to ownership of wholly outside interests. Bryant was the second paper mill located in Kalamazoo, the third in the Kalamazoo River Valley and the fourth to have been built in Michigan.

Noah Bryant, founder of the Bryant Paper Company, had learned the paper business in England. He came to the United States in 1859, moved to the Kalamazoo River Valley in 1871 when he became foreman with the Kalamazoo Paper Company, first located in the city, and the second in the State. Previously a small mill had been erected in Ypsilanti.

In 1885, Bryant went to Otsego where the Kalamazoo River Valley's second mill, the Bardeen Paper Company, was started by Bryant and George E. Bardeen. Then in 1895, convinced that Kalamazoo was the logical center of the valley's future papermill development, he returned to Kalamazoo to form the Bryant Paper Company, with a capitalization of $125,000. Associated with him was his son-in-law, Frank H. Milham, who became the company's third president.

The original mill was built to house two paper machines. On the banks of Portage Creek, it had an abundant supply of water. The first machine installed was a 116-inch fourdrinier and later a 124-inch fourdrinier was placed in operation.

Business was good, so on July 1, 1906, the Bryant company, still under the presidency of Noah Bryant, bought the Imperial Coating Company, a complete and modern coating mill that

had been erected just west of the original Bryant plant. This is now known as the Imperial division and opened a new field of coated papers for the original book paper mill. This same year, 1906, the Superior Paper Company was purchased by Bryant. Located just across the street from the first Bryant plant, now known as the Bryant division, acquisition of this mill added a 110-inch Harper and a 120-inch fourdrinier machine to its papermaking equipment.

Then the No. 2 mill was erected, housing a 136-inch machine, and a short time later the No. 3 mill was built with a 138-inch machine. Another step forward was taken in 1910 the Milham division was constructed on property northeast of the original holdings. Three paper machines were installed in this division, a 136-inch Harper, and a 140-inch and a 154-inch fourdrinier.

Thus by 1925 the company had 10 machines in operation, had 24 coating machines going in its Imperial division, and its payroll had grown from the original 125 to more than 1,200 men and women. The annual production grew to 75,000 tons of book and coated paper—enough to make 50 trains of 75 loaded cars each. By this time the original stock of $125,000 had grown to an authorized capitalization of $6,000,000, of which $5,000,000 common had been issued. For a time there was a regular dividend rate maintained of one per cent a month. There was also in 1925 $300,000 preferred stock outstanding while $500,000 or a $5,000,000 bond issue had been sold.

Since 1925 much reconstruction and replacement of machines has taken place, so that at the start of the war the company had one machine in its Superior division, three in the Bryant division and three in the Milham division, as well as 24 coating machines in its Imperial division. Today the company's daily production when running at peak capacity is equivalent to a sheet of paper 15 feet wide that would reach from the Bryant office in Kalamazoo to the Times Building in Times Square, New York.

In the original company, Noah Bryant was president, H. E. Everard vice president, Frank H. Milham treasurer, Charles B. Hays, secretary. John F. King, founder of the King Paper Company, now a unit of the Allied Paper Mills, was a director. Bryant was president from 1895 until 1907. H. P. Kauffer was president for a short period during 1907, and early in 1908 Frank H. Milham was elected president. He served until 1921. Felix Pagenstecher took office in 1922 and

Allan B. Milham

remained until his resignation in 1931. In 1932 W. B. Milham was named and was succeeded in 1936 by William T. Schmitt, who had been executive vice president and general manager since January of 1932.

Schmitt resigned in August of 1938 and William J. Lawrence, until that time president of the Paper Makers Chemical Corporation, which was then sold to Hercules Powder Company, was elected president. Lawrence died in November of 1941 and Dr. S. Rudolph Light was named president, to serve through 1942. At the same time Allan B. Milham, grandson of Frank H. Milham, became executive vice president and general manager, and he succeeded to the presidency Dec. 18, 1942, the post he holds now.

◆

VICTORY-VETERANS ADDS VV TO PROGRAM FOR MORE WASTEPAPER

The executive Committee of the U. S. Victory Waste Paper Campaign has developed a new plan to stimulate wastepaper economy. It is believed this new approach has the approval and indorsement of many of the large national bodies. Not only is it believed the public interest in this vital subject will soar to new heights, but wastepaper will serve a new double role.

The new program is called the Double-V Waste Paper Program (*see Page* 1538). The Double V has a special significance—*V for Victory and V for Veterans.* This is how it works. Communities are urged to enlist local organizations such as churches, service clubs, social and fraternal groups, Boy Scouts, Girl Scouts, even individuals, to sell wastepaper and see that the money received for it is used to aid the veterans who have borne the brunt of battle . . . brighten their convalescence.

Wastepaper funds have bought and can buy such things as 'phone calls to homes, phonograph - radio combinations, sound-movie projectors, records, sun porch furniture, settees, lounge chairs, game tables, pianos, musical instruments, cigarettes, ash trays, etc. Organizations can make their own plans and set certain goals. Many are arranging to allocate their funds locally for the local boys.

Any inquiries about this plan should be addressed to Edwin S. Friendly, chairman, U. S. Victory Waste Paper Committee, 370 Lexington Avenue, New York 17, N. Y. The committee stands ready to co-operate in any way possible.

(*Editor's Note: This magazine desires to follow the results of this campaign, and will welcome for publication news from communities where this plan has been carried out with satisfactory results.*)

◆

FLINTKOTE ACQUIRES THREE NEW PROPERTIES— NFLD, CANADA AND U. S.

The acquisition of three new properties located in Newfoundland, Canada, and the United States was announced last month by The Flintkote Company, of New York.

The Flintkote Company (NFLD), Ltd., a subsidiary, has entered into an agreement with the Newfoundland Railway Company and the Newfoundland Government to supply requirements for creosoted ties and poles under a long term contract utilizing wood-impregnating plant facilities nearing completion at Clarendon, Newfoundland, and representing the only source of such supply in Newfoundland.

A mining property in Canada near Thetford Mines, Province of Quebec, also has been acquired by a newly organized subsidiary of The Flintkote Company, Ltd., Canada, known as Flintkote Mines, Ltd. Construction is underway on mining and milling facilities for the production of various grades of asbestos fiber. Ownership of the mine gives Flintkote an important source of raw material for its line of asbestos-cement roofing shingles, sidings, and accessory products.

Further expansion is indicated by The Flintkote Company's acquisition of the Whippany, New Jersey, rubber reclaiming plant of Raybestos-Manhattan, previously operated by the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc. This plant and a 55-acre property near Morristown, New Jersey, will

PAPER · · · America's 6th Industry

PAPER "WIPE" REPLACES CLOTH

(NEWS ITEM: *Over 20,000,000 lbs. of paper lens tissue was used by the Navy in 1944 as a substitute for wiping rags.*)

The Armed Services are using wiping cloths made of paper instead of critical cotton for cleaning lenses, machinery, etc. Cheaper than cloth, this new paper product is free from lint, grit and acidity. It's as serviceable wet as dry.

Greaseproof paper as a substitute for parchment . . . Laminated Kraft paper bags to replace burlap . . . Paperboard containers to conserve metal . . . Impregnated paper to take the place of cloth . . . New uses for paper, calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

Puseyjones men and production facilities are at war—and Industry at War is Industry thinking and working at hitherto unheard of speeds. Our Research and Development Committee, working on the problems of America at War, is finding many practical and technical advantages that will be of incalculable value to America at peace—to the Paper-Making Machinery of the future.

We are in a position to repair or modernize existing machines where essential to the war effort and as approved by the War Production Board . . . If you have not received your copy of our bulletin, "New Features in Paper Making Machinery", write for it today.

The new Puseyjones Paper Production CALCULATOR is yours for the asking. A time saver for superintendents, engineers, executives or other interested members of your organization.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

provide greatly needed additional facilities in New Jersey and will permit the relocation of certain operations from the main plant at East Rutherford, New Jersey.

The Flintkote Company was started nearly fifty years ago as a pioneer manufacturer of asphalt roofings. Since then, because of constant research, expansion, and diversification, the company has grown so that today it owns and operates 18 plants and warehouses with 21 sales offices, serving every strategic market area in this country, Canada, and Great Britain.

◆

FINANCIAL

Paper mill securities in general followed the leadership of other industrial stocks which, during the month, rose to average prices which are the highest in seven years.

Bird & Son, Inc.—Net profit for 1944 was $786,572, as compared with $835,836 in 1943.

Celotex Corporation—Net earnings for the fiscal year ending October 31 were $562,276, as compared with $530,199 for the preceding fiscal year.

Container Corp. of America—Net profit for 1944 was $2,063,200 as against $2,184,054 in 1943.

Robert Gair Company, Inc.—Net income for 1944 was $916,100 as against $1,064,486 in 1943.

Hummel-Ross Fibre Company—Net income for fifty-three weeks ending December 30 was $374,106, as compared with $394,865 for a similar period in the preceding fiscal year.

Kalamazoo Vegetable Parchment Company—Net profit for 1944 was $605,799 as compared with $823,479 for 1943.

Keyes Fibre Company—Net income for 1944 was $289,246 as against $203,467 in 1943.

Paraffine Companies—Net profit for six months to December 31 was $1,020,790 as compared with $945,783 for the same period in 1943.

Rayonier, Inc.—Net profit for nine months ending January 31 was $1,420,261, as against $1,230,614 for the comparable period in the previous fiscal year. During the year bank loans were reduced $500,000 to $2,500,000.

Scott Paper Company—Net profit in 1944 was $1,566,220, as against $1,534,926 during 1943.

Strathmore Paper Company—Net income for the year to October 31, 1944, was $211,802 as against $249,789 for the comparable period of the previous year.

Sutherland Paper Company—Net profit for 1944 was $710,099 as against $820,506 in 1943.

United Paperboard Company—Net profit for six months ending November 30 was $67,359, as compared with $49,894 for the comparable period in the preceding year.

U. S. Envelope Company—Net income for 1944 was $791,300, as against $811,208 in 1943.

Union Bag & Paper Company—Net income for the year 1944 was $1,584,013 as compared with $1,058,476 in 1943. The company set aside over $5,000,000 for income and excess profits taxes in 1944 as against less than $2,000,000 the previous year, and the amount of outstanding debentures was reduced $1,125,000.

New York Stock Exchange—Stocks

	Closing Prices Feb. 26	Jan. 25
A.P.W. Products ..	5⅜	4⅞
Celotex	16	15⅞
Same Preferred..	19⅞	19
Certainteed Prod..	8½	8⅛
Same Preferred..	147	137½
Champion P&F Co.	33¾	29½
Same Preferred..	113	114½
Container Corp. ...	28⅞	28¼
Cont. Diamond ...	12	11⅜
Crown Zellerbach .	22	21½
Same Preferred..	104¼	103⅛
Dixie Vortex .....*	19–19½	20
Same "A" .....*	48¾–49	48½
Robert Gair	6⅜	5½
Same Preferred..	17½	17
Gaylord Container.	20⅜	23½
Same Preferred.*	58½–60½	*58–58¾
International Paper.	24⅛	19¾
Same Preferred..	90¾	87
Kimberly Clark ...	45½	42
McAndrews & Forbes*	31¾–32	*31–33
Masonite	43¼	42½
Mead Corp.	14	13
Same Preferred.*	100–101	*98¾–100½
National Container.	14	14
Paraffine Cos.	*60½–61	57
Same Preferred..	109	108¼
Rayonier, Inc.	18⅝	16¼
Same Preferred..	35½	35
Scott Paper .....*	42⅜–43¼	*43–44
Same 4½% Pref.*	111–113	*112–114
Same 4% Pref..	109	*109–110½
Sutherland Paper .	33½	*33⅞–34⅛
Union Bag & Paper	15¾	14½
U. S. Gypsum.....	85	78
Same Preferred..	183	*181⅛–183
West Va. P&P Co.*	26¼–26½	25¼–24
Same Preferred.*	110⅛–110½	109½

New York Stock Exchange—Bonds

Abitibi 5%	102½	102
Celotex 3¾%	103¾	.....
Certain-teed 5½%.	103⅛	102¼
Champion P&F Co.	.....	.....
Intl. Paper 5%....	104¾	.....
Same 6%	109½	.....
West Va. P&P Co..	.....	.....

New York Curb Exchange—Stocks

Am. Writing	6¾	.....
Great Northern ...	38¼	36
Hummel Ross	8⅛	7¾
St. Regis	6⅝	6¼
Taggart	6¾	.....
United Wall Paper.	5⅛	4⅝

*Closing Bid and Asked Prices.

H&W CHICKASAW MILLS AWARDED ARMY-NAVY "E"

Honored as the first kraft paper mill in the nation to receive the coveted Army-Navy Production Award, employees of the Hollingsworth and Whitney Company Chickasaw Mills, at Mobile, Alabama, gathered at ceremonies held on the mill grounds Friday, February 16, when the Army-Navy "E" flag was presented by Major Roy D. Hickman, Chief of the General Office Division, Birmingham Ordnance District.

The award to the Chickasaw Mills came as the result of its outstanding assistance to the Ordnance Department in the development of a special artillery shell container paperboard and its production of this material on an ever-increasing schedule of demand for overseas ammunition shipments. Numerous other products of this Mobile plant have also contributed materially to the supply of converting papers for the war program.

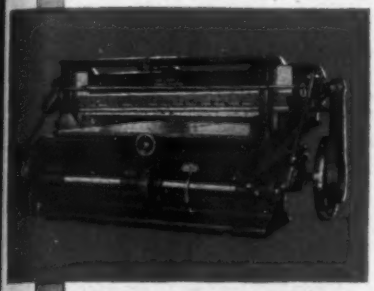
In the absence of M. L. Madden, president of the Hollingsworth and Whitney Company, the flag award was accepted on behalf of the Chickasaw Mills by his son, James L. Madden, vice president, who served as head of the Pulpwood Section of the War Production Board.

◆

CANADIAN PUBLISHER CONSIDERS NEWSPRINT SITUATION TO BE GRAVE

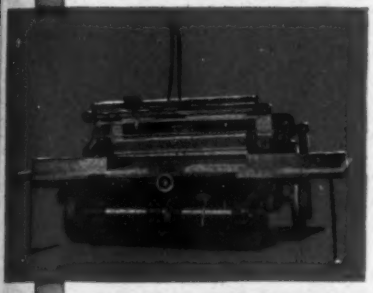
The newsprint supply situation "is going to be tight for some time yet to come," Cranston Williams, general manager of the American Newspaper Publishers Association, told a regular monthly meeting of the Newsprint Association of Canada held in Montreal on February 22. Refusing to predict the duration of the present shortage, which he attributed in great part to the fact that much of the supply is going to fill demands from liberated countries, Mr. Williams said that the situation was too uncertain to make any guesses. "We did try predicting an end to the war," he said, "and look what happened."

He paid high tribute to the work done by Canadian woodcutters who had, he said struggled against a great many difficulties during this winter in getting out the pulpwood that was the first step in the making of news print. The people of the United States, Mr. Williams concluded, have a very high appreciation of Canada's war effort, of which the news print industry is an integral part. Everywhere one travels in the United States, he said, one hears glowing praise of what Canada has done to help win the war.



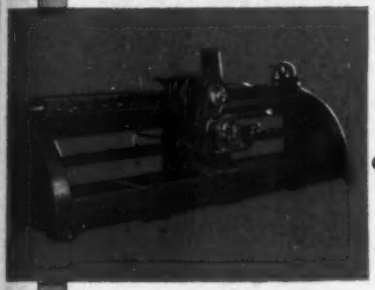
CUTTER

I'm a precision *machine*
Of massive design.
For accuracy—tops!
For speed—super fine!



SPACER

For making a series
Of accurate *cuts*
I'm a time-saving guy
With plenty of guts!



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*City*_____ *State*_____

JANUARY PULP CUTS ARE CONSIDERED AS PAPER BAROMETER

A forecast of an impending stringency in the nation's paper supply was given by action of the War Production Board in January ordering users of market pulp to cut their paper production from allocated pulp 5 per cent below the original authorization, and by a later action imposing a cut on the authorized use of kraft pulp for the production of paper bags.

The reason for this condition, which may be expected to become even more acute before the end of the year, is the combination of increased military demands and the shortage of pulpwood. A decrease in wastepaper collection is adding to the difficulties of the mills. Washington authorities have been told in plain terms that the trends of reduced supplies of raw materials, a tighter labor situation and decreased production of paper for civilian use will be immediately productive of economic difficulties for the mills.

Unless the industry can operate at a reasonable percentage of capacity the increased cost ratio to cover overhead mounts rapidly, and many mills today have reached the point where it is almost as costly to operate a mill as to leave it idle.

▶▶▶ CONGRESSMAN BOREN has renewed his opposition to any proposals that American pulp be shipped to Europe to operate mills in the liberated nations, such as France. Mr. Boren says it is questionable whether high alpha pulp, in such need here for the production of explosives, should be sent to France for use by the textile industries, producing rayon and synthetic fabrics.

PULP CUT FOR SECOND QUARTER IS FORECAST

Pulp allocation for the second quarter undoubtedly will be reduced from the tonnage allowed for the first quarter. This forecast emanates from the American Paper and Pulp Association, although no official word has come out of Washington. Current reports indicate a deficit of about 90,000 tons of pulp in the second quarter as compared with the first three months. Heavy reductions will be made in printing and wrapping papers.

The APPA states present indications are that the tonnage will be reduced 36,000 tons for the groundwood, printing and book paper mills, and 46,000 tons for the coarse paper producers, principally in kraft. Increases of 18,000 tons for container board and 2,000 tons for industrial papers are anticipated. Reductions of 10,000 tons each are expected for fine and sanitary paper mills, 5,000 for miscellaneous uses and 2,000 tons for folding boxes.

▶▶▶ NEWSPAPER publishers, WPB officials and Canadian newsprint manufacturers have revived the question of the production of 30-pound basis weight paper for newspaper use. Domestic authorities tried to encourage the output of this weight paper, but the Canadian mills found it uneconomical to produce, and the effort to increase yardage of paper with no change in tonnage allocations did not prove a success. The problem, however, is being given renewed study.

▶▶▶ FOR TEN YEARS, John S. Bancker has been a member of the U. S. Forest Service, stationed in the White Mountains of New Hampshire. He has now accepted the position of senior business specialist with the pulpwood unit of the OPA.

◆

POWELL RIVER COMPANY STOCK OFFERED FOR SALE

Public offering of 300,000 shares of Powell River Company stock at $18.50 a share has been announced, which constitutes a new development in newsprint financing. The Powell River Company has been a family concern since it was established in British Columbia by Dr. Dwight Brooks and his partner, M. J. Scanlon of St. Paul, Minnesota, 34 years ago. The company has no bonds outstanding and is arranging to convert its preferred stock into common, so that the only outstanding securities of the company will be 1,344,695 shares no-par-value common, of which the 300,000 new being offered form a part.

The Powell River Company has been successful from its very beginning, and even during the dark period of the middle thirties there was no year in which it did not make a profit. In 1944, it earned $1,750,000, after depreciation and taxes, or $1.30 per share, in addition to which the refundable tax equalled 28 cents a share. The Powell River Company is one of the largest producers of newsprint west of the Great Lakes. It is proposed to list the shares on the Toronto, Montreal, and Vancouver Stock Exchanges.

◆

KVP ANNOUNCES PLANS FOR SULPHATE MILL PROJECT AT ESPANOLA

Since the Kalamazoo Vegetable Parchment Company, Parchment, Michigan, acquired the Espanola (Ontario) mill from Abitibi in January, 1943, plans for the conversion of that plant have progressed steadily.

The Espanola mill formerly produced groundwood pulp and newsprint. It had been idle since 1938, due to the Abitibi company's long and involved receivership. The KVP company's purchase involved the groundwood mill, paper mill, hydroelectric plant, and the complete town site, plus arrangements with the Canadian Government for time concessions constituting cutting rights on about 4,000 square miles of land.

The latest developments in this construction program were released last month by R. A. Hayward, president of KVP. The following is reproduced from President Hayward's announcement:

▶▶▶ The Kalamazoo Vegetable Parchment Company has completed arrangements with the Dalton Engineering & Construction Company, Ltd. of 587 Fleet Street, Ontario, to supervise the construction program that is being carried on at Espanola, Ontario.

The project includes the erecting of a new building to house the digesters, washing equipment, recovery furnace, and cooking liquor making equipment for the production of sulphate pulp . . . a new wood room with chip storage bin, a new boiler house, a new water filtration plant . . . and to remodel the present buildings to accommodate the screens and bleaching plant.

A new vertical electric generator is being installed, together with an electrolytic plant for the production of chlorine and caustics.

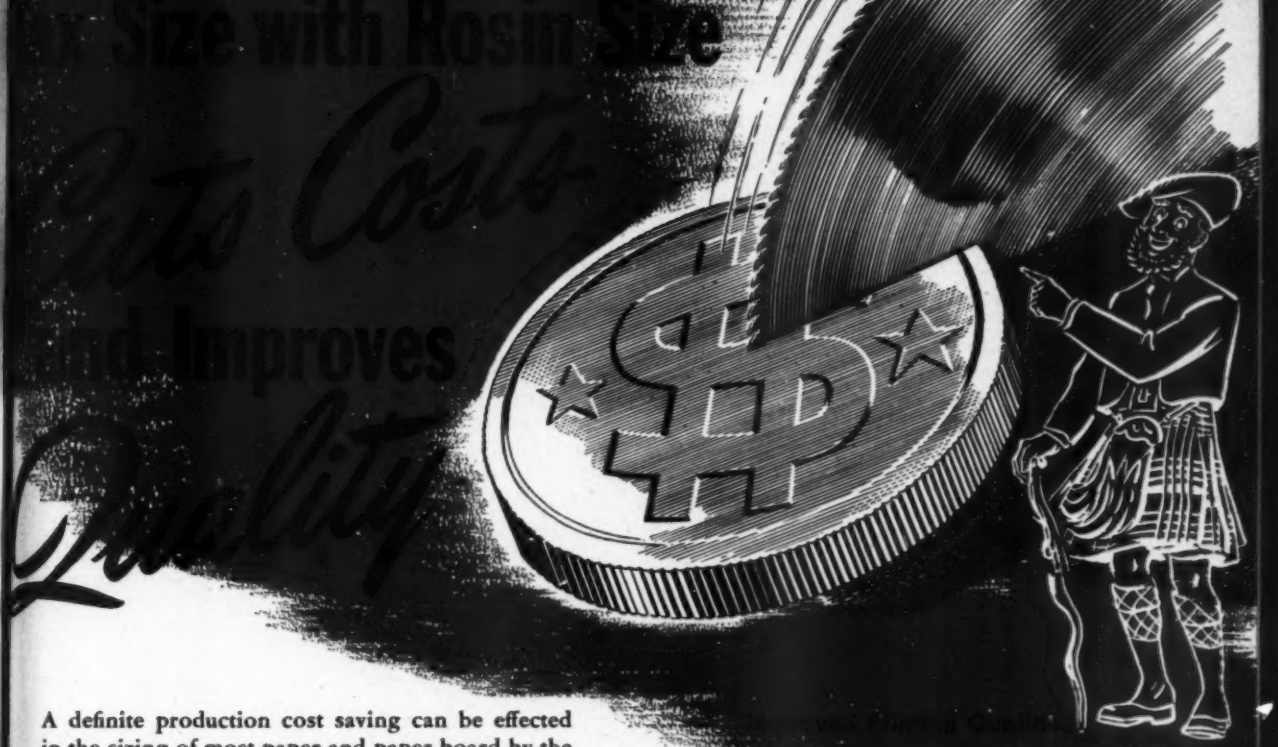
It is estimated that the entire construction program will cost $4,500,000.

Work has already started on the present buildings which are heated and protected, and considerable progress already has been made. The working force will be expanded rapidly with

the peak of the construction work

FLEXIBLE PACKAGING

being taken. Regional Forester Jay



A definite production cost saving can be effected in the sizing of most paper and paper board by the use of wax size in combination with rosin size. And... at the same time... paper quality can be improved through this practical "combination" sizing procedure. Here, in brief summary, is the how and why of the wax with rosin size method.

Higher Water Resistance

Paper and paper boards that will resist water penetration are successfully produced through the addition of both rosin and wax size in the course of stuff preparation. While producing paper with superior water-resistant qualities, the types of emulsion offered also assure safe paper machine operation, and in some cases even facilitate production.

Increased Pliability

The use of wax size with rosin makes it economically possible to attain improved pliability without sacrificing other essential characteristics. Wax sizes offset the tendencies of paper to crack and break due to loss in moisture content, thereby improving the creasing, scoring, folding, and crimping qualities of paper and paper board. This is especially pertinent at this time of year when indoor humidities are generally low.

Wax size
flatten out unde
that take clear, sharp
a minimum of printing
the smooth texture with a fine
desirable in attention appeal

Effective Savings

Considering changes that have taken
conditions in the past few years and als
of wax in sizing paper, wax sizes have
comparatively low-cost sizing materials.
technical service men and sales representatives
built up a fund of experience in the applicati
wax sizes and will be glad to discuss this
with you. Just write or telephone your Cy
representative about your problems.

Waxes • Wax Sizes • Rosin Size • Synthetic Resins • Casein • Alum • Sulphonated Oils • Fillers • Defoamers • Soda Ash • Caustic Soda • Salt Cake • Acids • Clays • Satin White • Aerosol* Wetting Agents • Calmicro (Calcium Carbonate) and other Paper Chemicals.

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DISTRICT OFFICES: Boston, Mass.; Philadelphia, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Chicago Ill.; Kalamazoo, Mich.; Detroit, Mich.; St. Louis, Mo.; Azusa, Calif.; Seattle, Wash.

the peak of the construction work coming in the months of July and August.

All work at the present time and all work contemplated before the spring opening will be carried on inside the present buildings which are heated and provide excellent working conditions.

It is expected that the construction work will take about eighteen months to complete. The construction force is being housed in the homes that were vacant in the community. There are also excellent boarding houses and a fine hotel to accommodate the men who are working there without their families.

Among the large number of contracts awarded for the project are the following:

The Dominion Bridge Company—Supplying and erecting all the structural steel. Also digesters and blow tanks.

The Combustion Engineering Company—Supplying and erecting the recovery furnace and the new steam generator that is being installed.

The Horton Steel Company—All the steel tankage.

The Dorr Company—causticizing equipment.

Allis-Chalmers Manufacturing Company—The new water wheel that is being installed and the rotary lime kiln.

The Sherbrooke Machineries Ltd.—Washers that will be used in the bleaching plant.

The Waterous Company—Barking equipment, chip screens, and chippers for the wood room as well as the mechanism that will be used in the bleaching plant.

E. Long Company—Oliver washers for the pulp mill.

Canadian General Electric Company—An d-c. generator for the chlorine plant.

Canadian Westinghouse Company—An a-c. generator to be connected to the water wheel.

Otto C. Schoenwerk, Chicago—Consulting engineer, supervising the plans for the pulp mill.

H. G. Acres Company—Acting consultants; plans for the waterpower development.

The typical construction is reinforced concrete; the framing of the mill is structural steel with concrete walls and haydite roof. All sash are factory type steel.

It is expected that the plant will be completed and ready for production in the early summer of 1946.

FLEXIBLE PACKAGING AID IN THE HANDLING OF WARTIME SUPPLIES

Revolutionary discoveries in flexible packaging have been of inestimable value in the packaging of war materials, particularly perishables. Because of this accomplishment in packaging, the Government has been able to handle critical materials and supplies with safety and economy.

Flexible packaging has been promoted largely by the Flexible Packaging Institute, a group which was formed in 1943. As a result of the organization's efforts and co-operation with the Government and manufacturers, this industry, which annually produces $100,000,000 worth of flexible packages is now fabricating flexible containers of treated papers and plastic, rubber and metal films for war and essential civilian needs. Wartime supplies reach the fighting front in a usable state and remain that way.

The results of the Institute's unified war efforts have made its members fully conscious of what co-operative effort can accomplish. And with that realization comes also the knowledge that when peace operations are again possible, many new packaging problems can be solved economically and efficiently with flexible packaging.

The Institute has been ably headed by Gordon H. Friend, president. As a service to manufacturers, the Institute also offers the counsel of Dr. Charles F. Roos, well-known economist and president of the Econometric Institute of New York City.

◆

FOREST INDUSTRIES COMMITTEES OF THREE STATES MEET JOINTLY

A joint session of the Forest Industries Information Committees of Wisconsin, Michigan and Minnesota was held in Milwaukee, Wisconsin, on February 1. Officers of the committees of the states participating were in attendance. National Committee Chairman E. W. Tinker (American Paper and Pulp Association) and Secretary Donald M. Rochester, of New York City, together with Harris G. Collingwood, National Lumber Manufacturers Association, Washington, D. C., participated in the meeting.

A Wisconsin legislative proposal, originating in the Wisconsin Conservation Department which would prevent the unrestricted cutting of immature timber, was explained by F. G. Wilson, Wisconsin Conservation Department, and discussed by the Committee without any formal expression of the Committee's attitude being taken. Regional Forester Jay Price talked on the Maryland bill and the so-called "model" bill sponsored by the Council of State Governments. Stanley G. Fontana, of the Michigan Conservation Department, explained a proposal of similar intent now under discussion in Michigan.

Mr. Tinker said there was a very acute need for an estimate of forest stands and tree growth in the Lake States which could be related to present and future requirements of the industries, particularly with respect to wood requirements from the pulp and paper mills, which co-operation, he urged, be extended by the industry and for which a committee will be appointed to co-operate with Mr. Price's office. Messrs. F. E. Sensenbrenner, of Kimberly-Clark Company, and George Kilp, Nekoosa-Edwards Paper Company, both stated that the lack of this type of information was a definite handicap in industrial planning in the paper industry.

◆

RCAF PLANES WILL BE USED TO SPRAY CANADIAN FORESTS

At a recent conference of Canadian and United States scientists called by Hon. W. G. Thompson, Minister of Lands and Forests for Ontario, it was announced that Royal Canadian Air Force planes and crews will be made available this year for spraying Canadian forests against the budworm which is depleting large areas of Ontario forests. Some spraying from airplanes was done last year with what is understood to have been good results.

In the meantime, other experimental work will be continued with the budworm, which has seriously affected 62,000 square miles of forests in Eastern Canada, particularly balsam and white spruce. It was also announced by Mr. Thompson that plans are being considered for post-war expansion of the department's telephone and high-frequency radio system throughout the vast timberlands for the fire-protection service. With better planes, the provincial air service will also be expanded after the war.

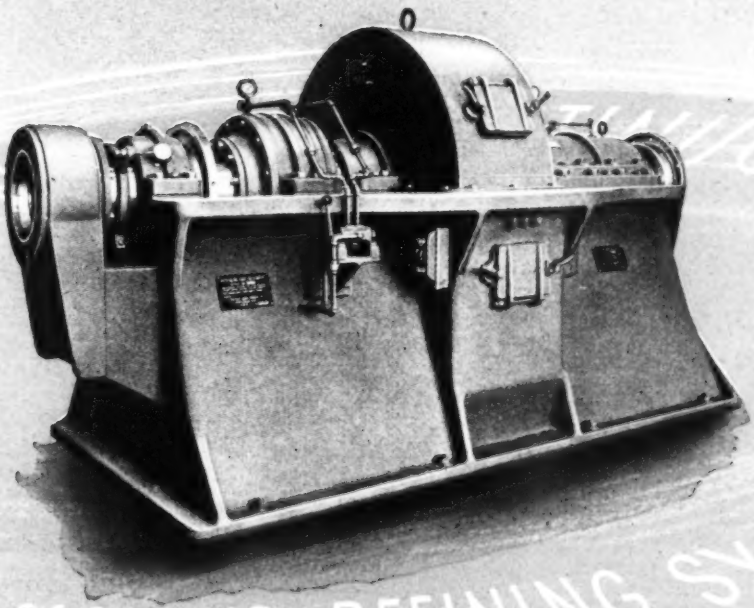
◆

PLANS FOR MILL AT PORT ALBERNI ARE PROGRESSING

Plans for the establishment of a new sulphate pulp mill at Port Alberni, British Columbia, have advanced a stage further. Bloedel, Stewart & Welch, Ltd., one of the major timber concerns of British Columbia, were planning the erection of such a mill alongside their large sawmill at Port Alberni at the outbreak of the war. Since that time, while

SUTHERLAND continuous

SUTHERLAND *continuous beating and refining system*



One Sutherland Alone prepares furnish of one paper machine making Bond, Book and Specialties.

TRENTON, NEW JERSEY

SUTHERLAND
REFINER CORPORATION

no major move toward building the mill was proceeded with, plans were quietly completed. It has now been announced that, contingent on the approval by the Provincial Government of an assessment agreement between the City Council of Port Alberni and the company, that the company will erect a plant there with an annual production of 50,000 tons of sulphate pulp.

To secure the passage of enabling legislation for the assessment agreement, a petition to obtain the necessary three-fifths or more of the number of registered voters in Port Alberni is being prepared. No difficulty is anticipated by the City Council or the Port Alberni Board of Trade, which has backed the project, in securing the required number of names.

◆

GPO INAUGURATES AWARD

An award has been inaugurated by the Government Printing Office, according to A. E. Giegengack, public printer of the United States, for presentation to firms within the Graphic Arts industries and to suppliers of paper, equipment, and material in recognition of meritorious service to the Government during the war period. It is realized that eligibility requirements for the Army-Navy "E" awards exclude printers and lithographers from consideration because they are classified as service organizations.

The award will consist of a certificate, stamped in gold to form a blue and gold medallion of Benjamin Franklin. It bears the seal of the GPO in gold and carries the signature of the Public Printer under these words:

"Awarded in recognition and appreciation of the exceptional services performed for the United States Government Printing Office in the production of printed material essential to the Nation in the prosecution of the war."

Firms which receive the award will be given cards for distribution to their employees indicating their participation and co-operation in the war effort. Quantity of work accepted, percentage of performance, quality of output, and the business standards of the nominee shall be the determining factors, each having equal weight of 25 points in the determination, but no firm will be eligible if its total rating is less than 70 points, provided also that it is not rated less than 10 points on any one factor.

Nominations may be made by officials of the Government Printing Office and by recognized leaders in the Graphic Arts field who are familiar with the business operations and record of GPO contractors. Nominations are now being received, and the Public Printer expects in the near future to announce the selection of several firms. Letters of nomination and inquiries regarding further particulars of the award should be addressed to the Deputy Public Printer, Chairman of the Awards Committee, Government Printing Office, Washington, D. C.

CERTIFICATE OF

MERIT

John Doe Printing Company, Inc.

Awarded in recognition and appreciation of the exceptional services performed for the United States Government Printing Office in the production of printed material essential to the Nation in the prosecution of the war

Washington, D.C.

◆

CERTIFIED PULP TESTERS

The following up-to-date list of pulp testers, approved by the Certified Pulp Testers' Bureau, has just been released:

Pulp and Paper Mill Laboratories

Harry C. Bradford, Rex Paper Company, Kalamazoo, Michigan; Clarence T. Clark, Restigouche Company, Ltd., Campbellton, New Brunswick; C. M. Connor, Glassine Paper Company, West Conshohocken, Pennsylvania; N. W. Coster, Soundview Pulp Company, Everett, Washington; Clarence A. Enghouse, Crown Willamette Paper Company, West Lynn, Oregon; G. H. Gallaway, Crown Willamette Paper Company, Camas, Washington; Nelson Hartnagel, Fibreboard Products, Inc., Port Angeles, Washington; Victor R. Johnson, St. Marys Kraft Corporation, St. Marys, Georgia; Franklin Jones, St. Joe Paper Company, Port St. Joe, Florida; K. C. Logan, Pacific Mills, Ltd., Ocean Falls, British Columbia; L. W. Parent, Port Royal Pulp & Paper Co., Ltd., Fairville, St. John, N. B.; Joseph Quinn, 18 Campbell Avenue, Castleton-on-Hudson, New York; R. H. Stevens, National Container Corporation, Jacksonville, Florida; G. R. Tennent, Hummel-Ross Fibre Corporation, Hopewell, Virginia; F. J. Weleber, Hawley Pulp & Paper Company, Oregon City, Oregon; H. R. Wheeler, Jr., Oswego Falls Corporation, Fulton, New York; Edward P. Wood, Hollingsworth & Whitney Company, Mobile 7, Alabama.

Commercial Laboratories

A. B. Andrews, Box 57, Lewiston, Maine; Cellulose Products Laboratory, E. D. Rich, director, 2010 Sixth

Avenue, Tacoma, Washington; Danneker & Evans, Inc., 309 Camp Street, New Orleans, Louisiana; J. T. Donald & Company, Ltd., 1181 Guy Street, Montreal, Canada; Hamlin & Morrison, 216 South 2nd Street, Philadelphia; Milton Hersey Company, Ltd., 980 St. Antoine Street, Montreal, Canada; K. Hv. Knudsen, 87 Gold Street, New York City; Orthmann Laboratories, Inc., 647 W. Virginia Street, Milwaukee, Wisconsin; Everett J. Schwantes, Gulick-Henderson Company, Inc., 431 S. Dearborn Street, Chicago; Skinner & Sherman, Inc., 246 Stuart Street, Boston; B. K. Steadman, Reynolds Metals Company, Richmond 13, Virginia; U. S. Testing Company, Inc., 1415 Park Avenue, Hoboken, New Jersey; Wiley & Co., Inc., 904 N. Calvert Street, Baltimore, Maryland; E. F. Whittington, 530 West Cedar Street, Kalamazoo 45, Michigan; Williams Apparatus Company, Inc., Herald Building, Watertown, New York.

◆

ALTON BOX BOARD CO. WINS ARMY-NAVY "E"

Special ceremonies attended the presentation of the Army-Navy "E" Production Award to the men and women of The Alton Box Board Company's plant for excellence in war production.

The presentation was made at the Alton plant on Friday, March 16.

◆

GROUNDWORK STARTED FOR PORT ALBERNI PLANT

Plans have been completed by Bloedel, Stewart and Welch, Ltd. (timber interests), for the construction of a $6,000,000 sulphate pulp plant at Port Alberni, on the west coast of Vancouver Island (Cf. P. I. and P. W., Feb., 1945, p. 1404).

Ground work was begun early this month, following approval from the Port Alberni city council. The pulp mill will utilize the slab and waste wood from the company's sawmill. Estimated production of the new plant will be 50,000 tons of pulp from hemlock, fir, and cedar wood salvage.

◆ ◆

LUMBER INDUSTRY LAB. IN WASHINGTON, D. C., HOLDS "OPEN HOUSE"

Nearly 200 readers of industry and government attended "open house" on January 9, during which time they inspected the newly completed Lumber Industry Laboratory in Washington, D. C. Their hosts were the Timber Engineering Company, the National Lumber Manufacturers Association, and the American Forest Products Industries, Inc. Although the affair was staged as a "party," the

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work of the laboratory continued while the guests watched proceedings and listened to explanations by laboratory staff members.

The guests showed intense interest in the chemical laboratory where experiments are conducted seeking uses for lignin. In the same division of the laboratory, production of wood sugar and ethyl alcohol from sawmill wastes was explained.

The show-laboratory, operated by the Timber Engineering Company, is at the service of the lumber and allied industries. Carl Rishell, director of research for the Timber Engineering Company and the American Forest Products Industries, is assisted at the laboratory by a staff of chemists and wood technicians, specialists in their fields.

◆

PAPER MILLS IN CONN. RIVER VALLEY PREPARE FOR HIGH WATER SEASON

Remembering the disastrous floods of 1936 and 1938, paper manufacturers in the Connecticut River Valley have been making preparations for the anticipated high water period this spring.

Weather Bureau and Army Engineer Corps officials in Washington, Boston, and Hartford, Connecticut, agree that flood stages in the Connecticut River are almost a certainty this season due to the abnormally heavy snow coverage in the river basin.

The Chemical Paper Company, Holyoke, Massachusetts, late in February moved 1,000 tons of stock from its basement which was flooded in 1936 and 1938. The necessary precaution added to the already severe manpower strain, but the Chemical company has several pumps ready for use.

The American Writing Paper Corporation's maintenance force under Fernand Willemain, its chief engineer, has been preparing plans for the hoisting of electric motors and other machinery out of the water's reach. This company has not moved its stock, for, generally speaking, there is much less stock in basement storage than there was before wartime scarcities began. Cables and hoists have been distributed to the various mills so that machinery may be quickly raised and tied to the ceilings.

The Crocker and Albion divisions of AWP and the Valley Paper Company, in Holyoke, were shut down recently for half a day while engineers shut off the waterpower during a test of the sea-wall flood gates and pumping system which was built along a mile of the Holyoke paper-mill waterfront in 1940.

Briefs . . .

▶▶▶ A NEW FACTORY to be placed in operation for the government at Pine Bluff, Arkansas, by the Ammunition Container Corporation subsidiary of the American Can Company, will produce more than 6,000,000 artillery ammunition containers per month.

◆

▶▶▶ THE COMPANY'S NEW lightweight air-mail paper and letter paper made from flax fibre will be featured in a national advertising campaign by Ecusta Paper Corporation, Pisgah Forest, North Carolina. The campaign will stress the fact that the paper is an all-American product, manufactured from a raw material of which ample supplies are available. Through its campaign, the company likewise hopes to provide effective cooperation in the government-sponsored campaign for the use of lighter weight papers for all correspondence.

◆

▶▶▶ PERMISSION TO establish the first co-operative sustained yield unit in Oregon under the State forest code has been asked of the Oregon Board of Forestry by the Fir-Tex Insulating Board Company, St. Helens, Oregon. The unit would be established in Clatsop County on the Columbia River slope near Bradwood, and would include some 140,000 acres. Actual operations now cover 30,000 acres, with the company owning about 30 per cent and the State the balance.

◆

▶▶▶ TO STIMULATE INTEREST in producing wood for war, the New Hampshire Forest Products Committee, in co-operation with the State Extension Service, is sponsoring a woodcutting contest in each county. There are ten counties, and a 42-inch fast-cutting pulpwood saw, complete with blade and knob handles, will be awarded to the individual in each county who cuts the most wood up to the end of the contest, March 31. The wood must be measured in cords and fractions. The County Agent in each county will be the judge.

◆

▶▶▶ WINNERS OF the wartime Machine Shop Board efficiency trophy for the last quarter of 1944 was the crew at St. Lawrence Paper Mills at Three-Rivers, Quebec. In honor of the event the company entertained these war workers at a very enjoyable dinner at the Chateau de Blois. Master Mechanic William Boucher was equally good as master of ceremonies. Out of town guests were F. E. Palmer, assistant co-ordinator of the Wartime Machine Shop Board, and J. N. Stephenson, editor of *Pulp and Paper Magazine of Canada* and member of the Board's Award Committee.

◆

▶▶▶ THE UNITED STATES ARMY is probably the largest paper buyer in the world for its direct purchases of paper and paperboard approximates 700,000 tons per year. Purchases in 1945 will be not less than in 1944. Army purchases cover some heavy requirements for special papers. It buys over 50,000 tons per year of mimeograph paper. It consumes 26 per cent of the entire production of the waterproof paper mills.

◆

▶▶▶ FIRE CAUSED DAMAGES of approximately $100,000 to the interior of the Bates Valve Bag Company, Ltd., Vancouver, British Columbia. Reconstruction work commenced mmediately, and it is hoped the plant will resume operations in approximately two months. It is believed that considerable of the machinery can be salvaged.

◆

▶▶▶ THE MANUFACTURE OF ethanol (ethyl alcohol) from pulp liquor has just been started in the new $1,000,000 plant of The Puget Sound Pulp and Timber Company, Bellingham, Washington. At the start, production was at 40 per cent of capacity. When operating at full load, the plant will produce 5,500 gallons daily, with the Government taking the entire output for the manufacture of ammunition and synthetic rubber.

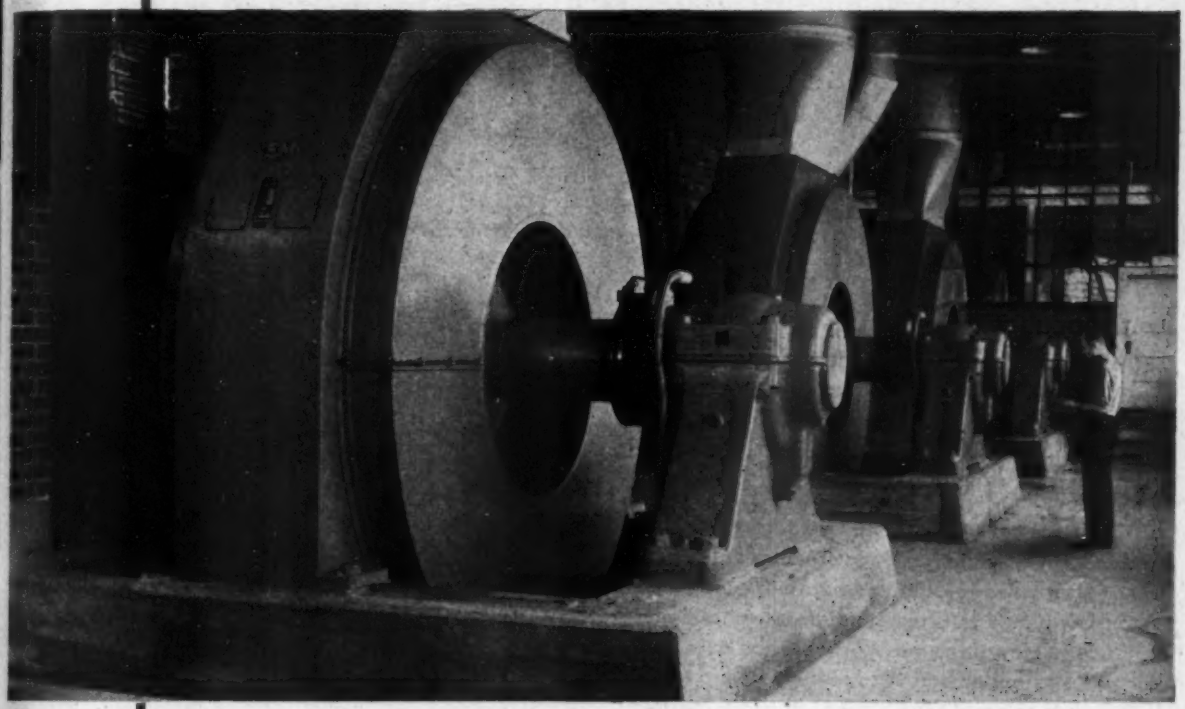
◆

▶▶▶ CONTRACTS FOR ADDITIONS to its paper mill at Kenogami, Quebec, have been awarded by Price Brothers and Company. The added facilities will improve the quality of the sulphite pulp manufactured and provide larger packing and shipping space.

◆

▶▶▶ A TORONTO FIRM, Anglin-Norcross, of Ontario, Ltd., will construct a laboratory at Sault Ste. Marie, Ontario, for the study of forest insect pests. The Ontario government is paying the cost of constructing the laboratory, and it will be staffed by scientists of government departments.

You Want REAL DEPENDABILITY for BIG Drives Like These!



To drive big pulpwood grinders that tear the fibers from nearly 200 tons of southern pine logs daily, takes motors with plenty of "guts".

These synchronous motors have it!

They've got it *because they were designed and built that way.* These three 4000 horsepower E-M synchronous motors, and a fourth bought later, deliver the punch necessary to do the job right. Each motor drives in tandem two huge grinders of the Great Northern type at a southwestern newsprint mill.

It takes a *special* kind of engineering . . . backed by thousands of synchronous motor horsepower correctly applied in paper and pulp mills . . . to build big motors like these.

We call it "E-M*gineering*". It's based on specialized manufacture, thorough knowledge of grinder drive requirements, careful motor design...and a will to give you "extra-value" construction.

Today, with larger pulpwood quotas and higher mill costs, dependable drives are a "must". You get *real dependability* when you specify E-M Synchronous Motors. *Call in the E-M engineer on your next drive problem.*

Write for FREE Copy of *"ABC of Synchronous Motors"*

A brand new, 20-page booklet describing the operating advantages and application of synchronous motors. Helpful and informative. Edited by competent authorities. Attractively printed in 3 colors. Send for your copy today!

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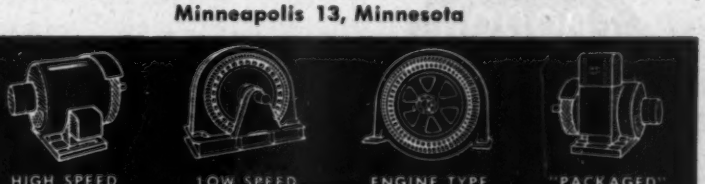
Minneapolis 13, Minnesota

SPECIFY E-M SYNCHRONOUS MOTORS



A3009

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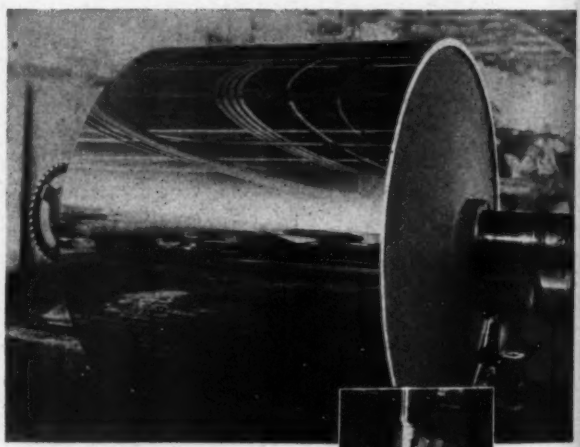
CRODON
The Chrome Plate
TRADE MARK REG. U.S. PAT. OFF.

Industrial chromium plating provides, protects and preserves flawless, precision-finished surfaces where protection against wear and corrosion is vital.

Long after ordinary equipment has been discarded, chromium-plated parts continue in regular operation. Protection against wear and corrosion does more than simply prolong useful life . . . it maintains new-equipment efficiency for extended periods. This unusual performance assures drastically reduced costs, coupled with increased operating efficiency and improved quality of product.

Chromium is the hardest commercial metal. Industrial CRODON-plating greatly prolongs equipment life and provides substantial operating economies. CRODON-plated equipment guarantees a better product. New-equipment performance is maintained for extended periods. Freedom from product contamination and attainment of more perfect finishes are substantial advantages. The normal life of parts is prolonged by chromium plating. Equipment replacement is less frequent. Maintenance expense and operating delays are reduced. The consistently satisfactory performance of CRODON-plated equipment also provides many other economies.

The trade-mark CRODON assures the best in chromium plating. CRODON is the dependable guarantee of the most practicable and economical service available. Behind every CRODON application are the resources, experience and reputation of America's oldest and largest industrial chromium plating organization.



Surface protection, long wear and a better finished product result from this high-lustre CRODON-plated 6-ton steel drum, 6' diameter x 5' face.

Chromium plating of small tools and parts is practical, inexpensive and provides many operating benefits.

Write for further information.

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LUBRICATION ENGINEERING . . . LUBRICATION ENGINEERING . . . LUBRICATION ENGINEERING . . . LUBRICATION ENGINEERING . . .

For easier handling in grease guns... longer life in anti-friction bearings

● THOSE TWO ADVANTAGES—easier handling, longer life—can materially reduce lubricating cost on the many anti-friction bearings in motors and machines in your plant. Stanobar Grease is a newcomer in the Standard Oil line—developed during the war. It has been tried in the proving ground of severe wartime demands and has made good on every claim for it.

Stanobar Grease was specifically designed to provide the benefits listed at the right. A Standard Oil Lubrication Engineer will be glad to help you put these cost-reducing qualities of Stanobar to work on your equipment. Write Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago 80, Illinois, for the Engineer nearest you.

Easier handling in grease guns and central lubricating systems is the result of the smooth (non-fibrous) structure of Stanobar. Two grades—Stanobar No. 2 for grease gun or hand-packing applications, and Stanobar "S," a soft consistency for volume dispensing in central lubricating systems—meet practically all anti-friction bearing requirements.

Longer lasting quality in Stanobar is obtained by the use of a special inhibitor which prevents oxidation. This means longer periods of operation between filling or cleaning and packing bearings.

Greater resistance to thinning out when "worked" in bearings reduces the possibility of leakage and may also permit the use of one grade of Stanobar in place of three or four greases now needed for various plant requirements.

Easy application is an advantage of Stanobar which is unusual in many greases suitable for high temperature service.

Buy More War Bonds

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

★ LUBRICATION ENGINEERING

PULP AND PAPER MEN ARE "A Revolution in

First Commercially Developed Hydraulic Barker for Pulpwood . . . Revolutionary Allis-Chalmers "Streambarker" . . . Can Save Average U.S. Mill $69,000 a Year in Brooming Losses Alone!

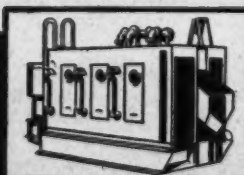
LOOK AT THE FIGURES: Based on recent industry statistics, the average U. S. Pulp Mill uses 48,142 cords of "rough" pulpwood annually. Brooming losses run anywhere from 2% to 15%. 6% is typical, figures out to 2,888 cords. At $24 a cord, that means a total loss of $69,312 a year through brooming alone *. . . a loss which can be entirely eliminated with new revolutionary "Streambarker"!*

And if you add *other* important Streambarker benefits — in manpower, space and cost — the final saving can be even higher!

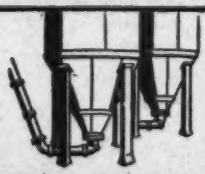
Why not substitute *your own* figures . . . see how much the new A-C "Streambarker" can save for *you!* Send for Bulletin B6341. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

NEW STREAMBARKER is Allis-Chalmers' answer for removing bark from pulpwood sticks — 4 to 8 feet long, from 4 to 18 inches in diameter — by means of water under high pressure!

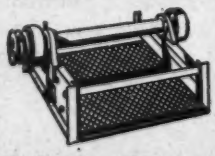
In *one* U. S. mill, an average of 14 cords of pulpwood per hour is being passed through "Streambarker" . . . with *no* brooming; sticks barked *clean,* with *no* dirt, *no* rot! The machine is running 24 hours a day, and the 14-cord average is based on 90, 4-foot sticks per cord!



PREPARATION — Hydraulic Barkers, Chip Screens, Saws, Slashers, Interplane Grinders.



COOKING — Digesters, Blow Tanks, Kilns, Stokers, Heat Exchangers, Condensers.

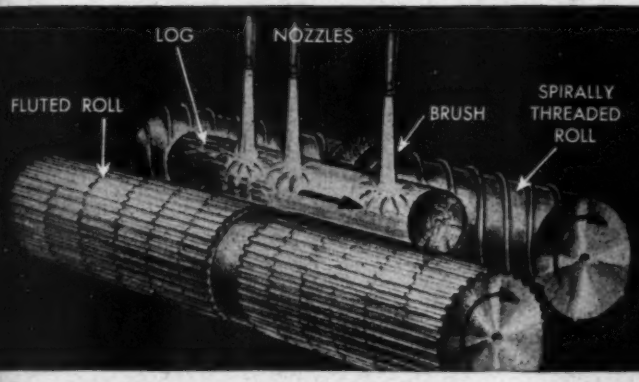


WET ROOM — vibrating-type screens for use as Thickeners, for dewatering rejects.

PAPER-MAKING — special design Drives for Paper Machines, Rewinders, Calenders.

ALLIS-CHALMERS

CALLING IT "Barking"



HERE'S SECRET OF STREAMBARKER! Water, forced at 650 lbs pressure through 3 specially designed nozzles, *rips off bark by erosive action* as log is revolved and propelled through machine by two bed rolls — one fluted, the other spirally threaded.

Here's What "Streambarker" Means to You:

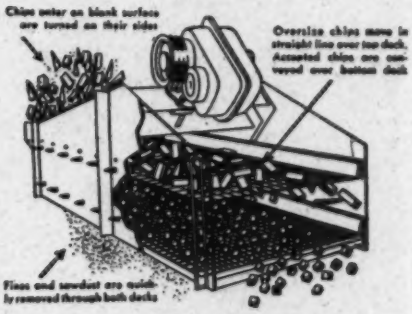
1. **BIG PRODUCTION** — at least 10 cords per hour, based on 90, 4-foot sticks per cord!
2. **LOWER PULPWOOD LOSS** — 150 ton mill can save $100,000 a year in brooming losses alone!
3. **SAVINGS IN MANPOWER.** For example, one 100 ton mill has been able to transfer 9 men from woodroom to other important jobs!
4. **LOWER COST** — initial and installation cost is less than for conventional barking equipment!
5. **COMPACTNESS** — valuable space in wood room can be converted to more profitable use!
6. **BETTER QUALITY PULP** — because wood through "Streambarker" is sound, clean—free from dirt and rot!
7. **SPEEDED OPERATION** — lower dirt count means less work, more speed for diaphragm screens!
8. **GREATER PROFITS** — it all adds up to lower costs, better pulp quality — and most important — bigger profits for you!

A 1845

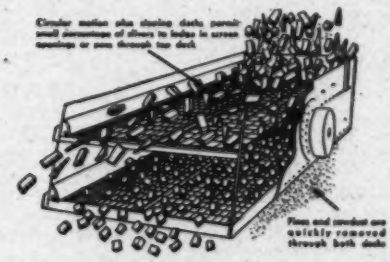
DEVELOPMENT NEWS

THE GROWING TREND toward use of Vibrating-type Chip Screens in existing and new mills indicates eventual *standardization* on this newer type by the industry. Four main reasons which have been responsible for this increased acceptance are: 1) Vibrating Chip Screens *cost less* than conventional revolving or shaker-type screens; 2) they take *less* space; 3) they require *less attention;* 4) they do a *better, faster* separation job than conventional screens.

Here are two *different* Vibrating Chip Screens which Allis-Chalmers offers:


Chips enter on blank surface are turned on their sides
Oversize chips move in straight line over top deck. Accepted chips are conveyed over bottom deck
Fines and sawdust are quickly removed through both decks

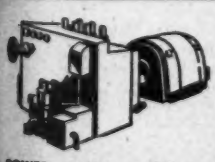
LOW-HEAD HORIZONTAL-TYPE Chip Screen — Its 45° straight-line vibratory motion in combination with horizontal decks assures the *highest percentage* of uniform chips. Reason is that all chips are carried in a straight line, *on their sides* — acceptable chips passing through, rejects and long slivers passing over, top deck.


Circular motion plus sloping decks permits small percentage of slivers to lodge in screen openings or pass through top deck
Fines and sawdust are quickly removed through both decks

RIPL-FLO INCLINED Chip Screen — Circular motion in combination with inclined decks assures an *average percentage* of uniform chips. Reason: a *small* number of slivers tend to turn on end and lodge in screen openings or pass through top deck and combine with accepted chips.

Send for Bulletin B6353 for *facts* to help you select the Screen that's best for you.

Tune in the Boston Symphony, Blue Network, every Sat. Eve.



POWER — all types of Power Generation, Distribution and Control Equipment.

MOTORS & CONTROLS — all types a-c and d-c Motors, ½ to 7000 hp — Gearmotors.

TEXROPE V-BELT DRIVES — fractional to 5000 hp — Constant and Adjustable speed.

PUMPS — Single & Multi-Stage, 10 to 150,000 gpm — Paper Stock Pumps, Fan Pumps.

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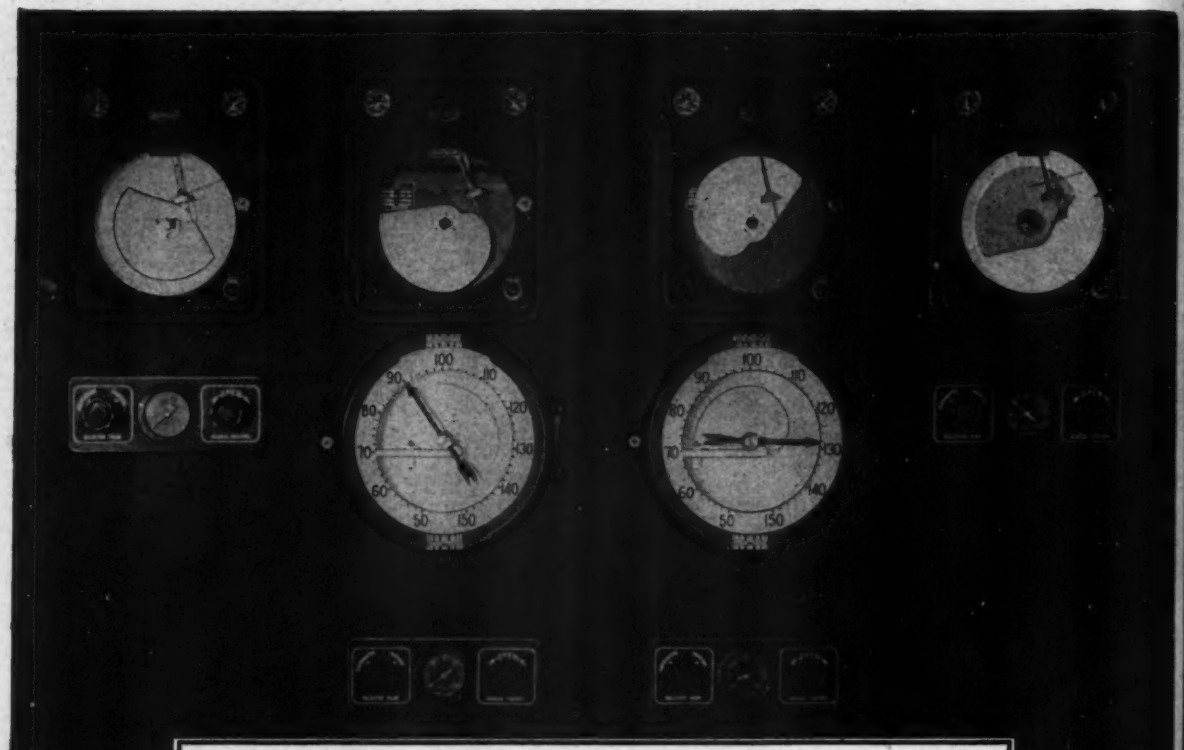

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- *Better Quality Pulp*
- *Fewer Rejections*
- *Lower Manufacturing Costs...*

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Remove as many variables as possible at the Digester and keep those remaining under strict control . . . then you're sure to get uniform pulp at decreased cost.

Masoneilan Digester Controls do just that by taking the guesswork from the cooking process. Once a cycle is determined, these controls will repeat any selected program year after year. Here are the advantages Masoneilan Digester Controls give you —

A UNIFORM PULP — by holding a constant time and pressure schedule and by varying the maximum cooking temperature to compensate for variations in the amount of free SO_2 in the cooking acid.

FEWER REJECTIONS — by controlling the selected and maximum temperature schedule.

UNIFORMITY FROM COOK TO COOK — Masoneilan automatic time cycle controllers consistently repeat and record the pressure and temperature of successive cooks.

LOW STEAM CONSUMPTION — Program controllers prevent over-temperaturing — hence over-cooking. On indirect circulating systems hot condensate is returned to boiler house at considerable saving.

UNIFORM STEAM CONSUMPTION — cycle controllers allow for proper spacing of boiler load.

GAS RECOVERY — time cycle control of relief gas properly proportions it to the recovery process to keep uniform strength in the reclaimed acid.

GREATER PRODUCTION — accurate timing and scheduling of each cook produces greater tonnage.

INCREASED PULP STRENGTH — pop and fold strength increase due to uniformity of the temperature cooking schedule.

DECREASED BLEACHING COSTS — uniformity of pulp decreases the chlorine requirement.

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IDEAS IN MESH

Out of the accelerated technical progress of these years have come new materials and processing methods. Du Pont research has contributed to these developments. But with current emphasis on production, there can be no pause to fully explore many of these improvements. Naturally, further work will be necessary in their ultimate adaptation to your production.

Du Pont will help you get, and keep, commercial application in mesh with these developments. Our fund of existing information is constantly being enlarged with recently acquired data. In some cases, use of this fund now may help ease present production difficulties—in others, it may mean a profitable start on postwar problems. E. I. du Pont de Nemours & [illegible], Dyestuffs Division, Wilmington 98, Delaware.

Du Pont Dyestuffs

DU PONT DYESTUFFS

What you do with your money can wreck you (*and your Uncle Sam*)

BUY, BUY, BUY! Foolish people are doing it, *over*doing it. But sensible folks know that with every needless purchase—or every time you patronize a black market or buy above ceiling—you do your bit to force prices up all along the line. That's the way inflation gets a boost.

IT CAN HAPPEN HERE—again! Today, with fewer goods in the stores while incomes are high, the danger of inflation is greater than ever. Inflation is always followed by depression. What can you do to head off another depression? Buy nothing you do not really—*really*—have to have . . . today.

SAVE, SAVE, SAVE! That's the way to make America good for the boys to come home to. Pay up debts, put money in life insurance, savings bank, War Bonds. Every cent you save now helps to keep prices down—and when the war is won you'll have use for that nest egg you've laid away.

A HOME OF YOUR OWN, a better farm, a real vacation, something to retire on—these are things worth saving for. Store up your money now while prices are high. There's a time to splurge and a time to save: today, while money's coming in, is a good time—the *right* and patriotic time—to SAVE!

4 THINGS TO DO

to keep prices down and help avoid another depression

1. Buy only what you really need.
2. When you buy, pay no more than ceiling prices. Pay your ration points in full.
3. Keep your *own* prices down. Don't take advantage of war conditions to ask more for your labor, your services, or the goods you sell.
4. Save. Buy and hold all the War Bonds you can—to help pay for the war, protect *your own* future! Keep up your insurance.

A United States War message prepared by the War Advertising Council; approved by the Office of War Information; and contributed by this magazine in cooperation with the Magazine Publishers of America

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Reproduced here are some of the better known Murray Woodroom and Paper Mill equipment that for years has been serving the paper industry — each item being improved as operating conditions demand more and more production — complete details upon request.

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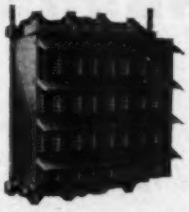

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High test cast iron heating sections—one piece construction; no soldered, brazed, welded or expanded connections.

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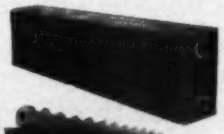
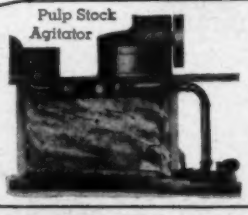


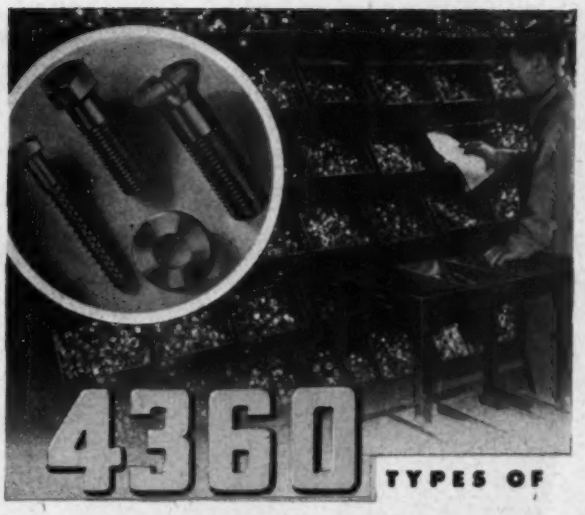
Pulp Stock Agitator



BLAST SECTIONS

D. J. MURRAY MANUFACTURING CO.

WAUSAU MURCO WISCONSIN



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Editorial

The Peak Demand for Paper Is Here

▸▸▸ WE ARE APPROACHING the peak demand for paper for war purposes. The demand for paper by the Armed Forces is concomitant with the war activities. The greater the war activity, the greater the demand for paper for war purposes.

We are engaged in two wars—one in Europe, the other in Asia. The hostilities in Europe are reaching the maximum. The peak in that area will pass this spring. Thereafter, all that remains to be done will be a mopping up in a comparatively small section of Germany of the last bunch of outlaws.

Then, all that is left is the cleaning up of the Japanese, who already are being brought to their knees. They are being blasted from the skies and the seas every hour of every day in constantly increasing casualties. They are now facing the choice of one or the other horns of their dilemma, decide or suicide. They can decide to surrender or die. Whichever they choose will not change the ultimate outcome. *They are defeated.*

So far as the war activity goes, this coming spring and summer will witness the slow-down in demand for paper for war service. And it's about time that demand should slow down. For, on the basis of the over-all production of paper this year, figured to be about 17,000,000 tons, the war services are taking about 90 per cent of the total, or 15,300,000 tons, leaving only 1,700,000 tons for civilian economy. In 1941, the over-all production was over 17,000,000 tons and practically all of it went to the civilian economy. The prospect of obtaining paper for civilian activities is the toughest today of any time since war began.

Since the break-through by the Germans on the western front last December, the demand for paper rose precipitately. During the first quarter of this year the orders from the war services were practically doubled. This imposed an additional burden of tonnage for immediate delivery upon the mills of the industry, which could not be delivered. This resulted in a tremendous shift in orders and disruption of running schedules, made necessary to produce the most critically needed supplies.

What the allocation of pulp will be and how it will be distributed for the second quarter is anybody's guess. However, it is our opinion that during the second quarter of this year, the official hostilities in the European area will be ended, and some recession in the feverish demand for paper for war purposes will be apparent and reflected in the allocations of pulp for the third quarter. Of one thing we can be certain: with the cessation of hostilities in Europe, the peak demand for paper for war purposes will have been passed.

However, let no one be deceived into believing that Victory over our European and/or Asiatic enemies will bring any particular easement in the huge demand for paper. The postwar activities, having to do with the reconstruction era of the world, will equal, if not exceed, the demand for paper during the destruction era. But that is another story which we will endeavor to cover later. Sufficient unto this day is the tough outlook thereof.

Scientists for the Postwar Period

▸▸▸ A VERY IMPORTANT problem of the postwar period has been visioned by Dr. Lucas P. Kyrides, organic research director of Monsanto Chemical Company.

On March 5, 1945, Dr. Kyrides was the recipient of the first Midwest Award of the St. Louis Section of the American Chemical Society for "meritorious contribution to the advancement of chemistry." In accepting this award, Dr. Kyrides expressed grave concern over the country's wartime policy of drafting young scientists.

"By continued drafting of young scientists and by arresting the development of our scientific replacements," said Dr. Kyrides, "we are . . . in my opinion . . . setting the stage for a scientific vacuum that will face the nation after this war. Consider the possibility of the war ending tomorrow. It would be six to ten years before there would be a graduating class of Ph.Ds."

He pointed out that England, having pursued the same course in World War I, is not now making the same mistake twice.

"She is not drafting her scientific personnel," he continued. "To the contrary, she is rendering every encouragement to science with the specific purpose of insuring adequate postwar replacements. Even in the darkest days of Stalingrad, Russian manpower requirements never reached the stage where Russia felt it necessary to call on her scientific men to bear arms.

"This leads inevitably to speculation on what we in America will face after the war in competition with other progressive nations . . . nations which will be adequately equipped with trained scientific replacements," said Dr. Kyrides. "Let us not assume that we can maintain our leadership without continuing to conserve and train scientists. It cannot be done."

To substantiate the statements of Dr. Kyrides relative to the present situation regarding the training of young scientists, all that anyone has to do is to visit most any institution of higher education today. The campus, lecture rooms, and laboratories will be found rather void of young men who in the normal course of events would be the scientists of tomorrow.

The pulp and paper industry has made great strides in recent years, at least in part, and a goodly part, too, because of the findings of fundamental and applied research. If such progress is to continue in the postwar years, the industry must continue to find its quota of well-trained and far-seeing research workers. Our hopes are that in some way the requirements of the industry will be met.

Current Thought

WILLIAM SIBLEY

"Over 32 Billion Pieces"

▶▶▶ BACK IN THE McKinley, the original Roosevelt, and Taft days, one of the big squawks of Vox Pop was the annual deficit of the Post Office Department. From figures available, it was thought that it cost far too much to run the postal service. And being a dyed-in-the-wool reactionary, I caused to be printed several editorials to the effect that the American people would be far better off, financailly and service-wise, if the postal department was a private enterprise like the express company, or the telephone and telegraph companies. That visualizes the sort of hairpin *I* am.

My ears, in this regard, were rather firmly pinned back not long ago by Edward N. Mayer, Jr., President of James Gray, Inc., New York, and one of the vice presidents of the B. M. A. A., in a recent talk he gave before the latter organizaiton. He spoke about the operations of the Post Office Department, which, according to his figures, handled (accepted and delivered) more than 32 billion pieces of mail, with an aggregate weight of approximately 3½ billion tons. In addition, through the Postal Savings department, it had assets of over 1½ billion dollars from approximately 3 million depositors, and during the year wrote and distributed some 350 million checks (money orders) having an aggregate value of some 4½ billion dollars.

One of the startling facts (to me) brought to light by Mr. Mayer's talk was that this tremendous volume of work was handled by a force of no more than 1,482 people (in the Washington, D. C., headquarters). Imagine any civil enterprise doing a business of this size where the "general offices" or "headquarters" did not employ far more than 1,482 people! Then he went on further to reveal some interesting figures which were:

"The latest figures show that the railroads of America received (from the Postal Department in the 1943 fiscal year) 125 million dollars, while the airlines received 25 millions. Such charges should give an idea of what it means to get letters delivered. Just for the record—the number of miles flown by the airlines in delivering air mail amounted to 88,595,162 miles (over 95 per cent of the miles scheduled), and the railroads traveled 486,466,650 miles. While the trains were moving, the mail clerks sorted and distributed over 20 billion pieces of mail (13 billion of which were letters). Motor vehicles totaled 68,234, and they covered 96,220,249 miles (7 million more than the airlines).

"One of the most amazing figures in the post office records, however, is the infinitesimal number of letters and packages that find their way to the dead letter office. True, there were 15,437,258 letters that were impossible to deliver, but 2,968,510 were returned to the senders and the balance represented less than one-twenty-fifth of 1 per cent, which in the face of bad handwriting and worse addressing should give some idea of the accuracy of the men and women who handle mail.

"$195,733.91 in actual cash was included in the dead letters, but of this amount the post office was able to return almost $150,000.00.

"A few more interesting facts—in 1943 the department bought, among other things, 2,916,616 pencils, $25,198.23 worth of ink, 7,920,000 pen nibs (yes, I know, not one single one of them would write), 3,018,010 pounds of twine, $67,863.53 worth of soap, $16,038.00 worth of towels (these two figures have nothing to do with obscence literature that had to be cleaned up before going through the mails), 1,441,460 descent lamps, 9,000 flashlight batteries, $31.622.80 worth of sewing thread (to repair mail bags, of course), 11,964,002 gallons of gasoline and 12 lawn mowers. (Whether the lawn mowers were to cut the whiskers off some of the bad jokes about the post office, I don't know, but I do know that in a recent survey of all government agencies, the post office was given first place for excellent care of its supplies, buildings and ground). And, "God Bless America," they bought 6,308 flags!

"Just one other thing . . . the post office is probably the most co-operative and helpful of all government agencies. Several years ago when I asked one of the top post office executives for some suggestions, he worked out with me the following hints . . . you may have seen them but here they are again . . . they're still valuable.

"1. *Count the pages of your booklets and catalogues.* A 24-page booklet with at least 22 pages printed costs only 8c per lb. to mail. A booklet of less pages, while perhaps less costly to print, costs 50 per cent more to mail. Check your costs—even in the face of paper shortages it may be cheaper over all to make your pages smaller and print 24 pages instead of 20.

"2. *Weigh your mail—it's cheaper than counting it.* Learn the regulations covering Section 562 P. L. & R. which permits you to mail in bulk and pay by the pound, rather than the piece.

"3. *Identical Does and mean identical.* Identical in Post Office parlance is literal only in the physical sense. Under Section 562 P. L. & R., if the physical details are identical the copy can change on every 20 pieces and still be permissible mail matter under this section.

"4. *Don't open fan mail.* Remember, the only way to reship it from a broadcasting studio to the main office or mailing house is unopened, by third or fourth class mail. If you open it, you'll have to pay first class postage in order to get it to your central point.

"5. *Special delivery and special handling don't go together.* Don't ever use both on the same package. Special handling gets first class handling for you only to post office addressed. Special delivery gets the same thing plus a special messenger to deliver it when it arrives at its destination.

"6. *Mail it at the right time.* Get a train schedule from your postmaster. You'll find it saves times on delivery. He'll show you that you may save as much as 24 hours on delivery by getting your mail to his office at 3:30 instead of 4 o'clock.

"7. *Check your mailing list—nobody else will.* Get instructions on the use of Form 3547. The greatest compliment to your prospect is his correct name and address on the mail you send him. Correct addresses save you money, too.

"8. *Zone numbers speed delivery.* Add the proper zone number to every name on your list . . . and add it to the address on your regular correspondence. The post office will put zone numbers on your whole list, be it local or national—*free.* Check with your postmaster . . . you'll help yourself . . . and him, too."

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ONE HIGH STANDARD OF QUALITY

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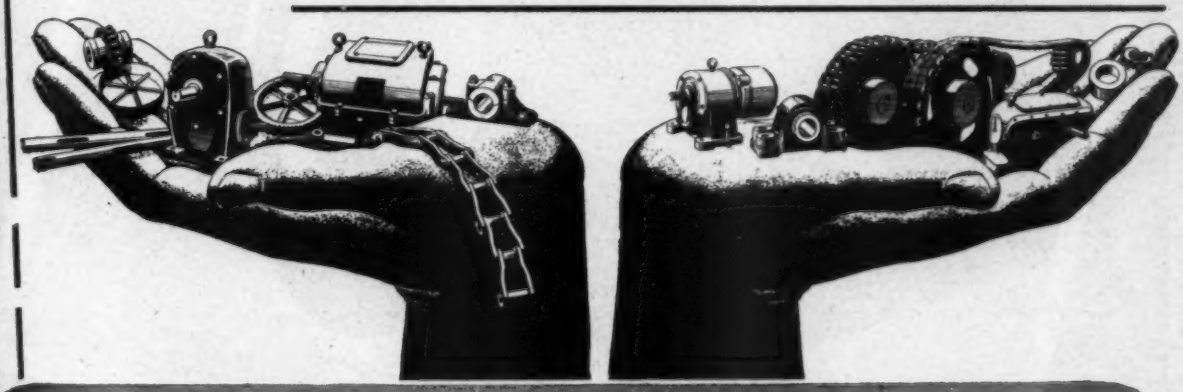

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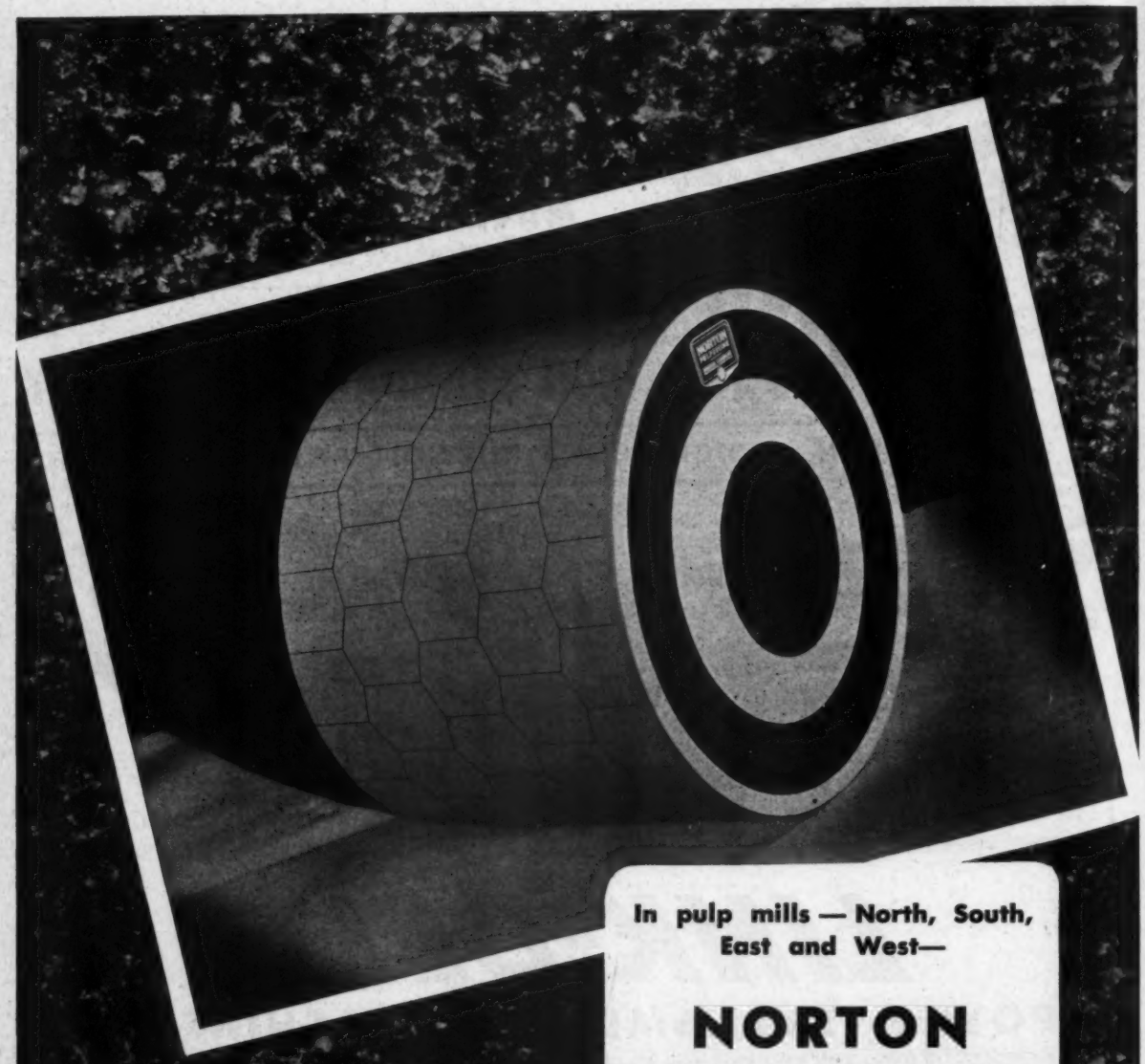

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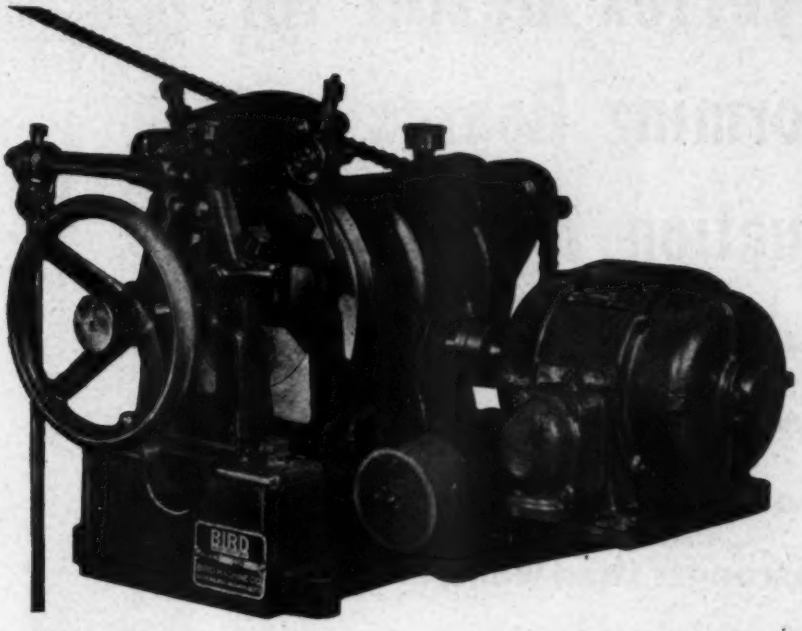

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Stronger than wood or rubber

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Ryertex was selected for the job because this laminated resin and textile composition has great strength and, with water lubrication, possesses an unusually low coefficient of friction. Complete uniformity and freedom from any tendency to warp or splinter were other important reasons for using Ryertex.

For more efficient operation in your mill use Ryertex for forming boards—for suction box covers; doctor blades; bearings on press rolls, calender stacks, beaters, jordans, grinders, bleachers, jack ladders, etc. Ryertex will do a better job. Send for detailed information.

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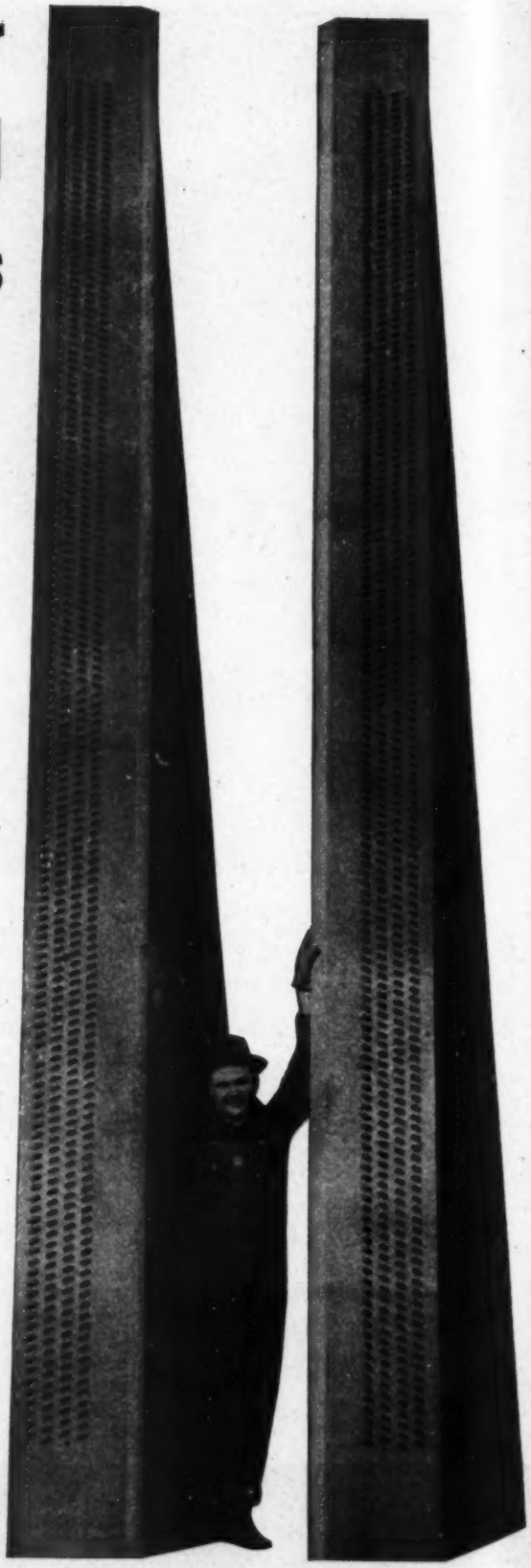

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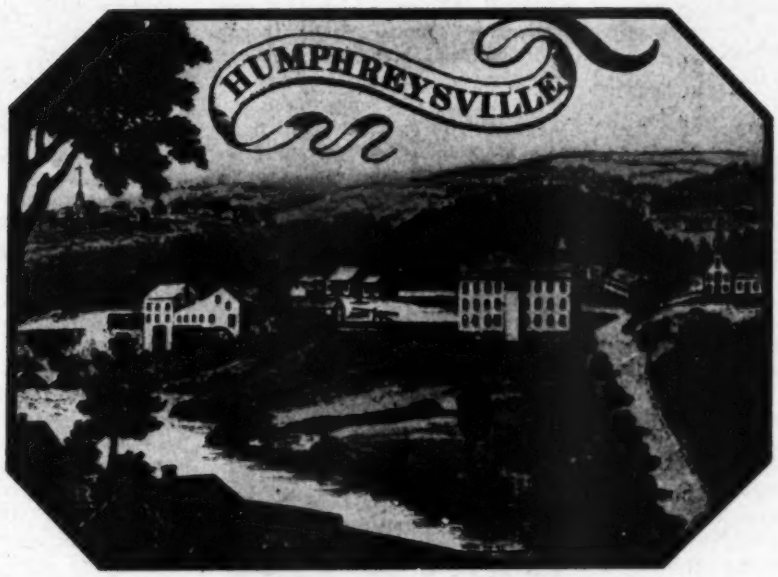


The first paper mill at Humphreysville, Connecticut, built by General Humphreys in 1805. (Humphreysville is now Seymour, between Naugatuck and Ansonia.)

Will Profitless War *Bring* Prosperous Peace?

CLINTON DAVIDSON, President
Management Planning Inc.

▶▶▶ THOSE WHO SPEAK of the current "paper shortage" might be interested in the situation that prevailed during our first great war. In the War of Independence, military operations were actually jeopardized by lack of scraps of paper on which to write essential messages and by lack of cartridge paper for wrapping shot.

On July 29, 1776, Washington's headquarters issued the following order:

"The Quartermaster-General is directed to furnish twelve quires of paper to each regiment per month, viz.: one quire to the commanding officer of the regiment, one to each company, and one to the adjutant; the remaining two quires to be kept by the colonel, as a reserve for special occasions, exclusive of orderly books and blank returns."

Many military messages expressed alarm over the possibility of having no paper at all for written messages, and some of these were written on margins of pages and torn from books.

Even cartridge paper was so scarce as to endanger the supply of ammunition. According to legend, the shot poured into the enemy at Brandywine and Germantown was wrapped in paper from Fox's *Book of Martyrs* and the *Saur Bible.*

(*Christopher Saur—Sower in English—was one of the leading printers in the Colonies. The needs of his printing led him to try the papermaking business, and he operated a mill located on the Frankford River, near what is now Manayunk, Pennsylvania. He printed many books, the most famous of which was the German Bible, known by his name. The Saur Bible was the second Bible printed in America.*)

Cases for musket cartridges used in the Battle of Monmouth are said to have been improved from printed copies of a sermon on "Defensive War" discovered in the garret of a house where Benjamin Franklin had previously conducted his printing business.

Committees of safety throughout the colonies were hard pressed for paper. North Carolina, controlling the sale of paper, directed that only one ream be reserved for its own committee of safety.

Colonial governments in general had difficulty obtaining paper, even for the printing of official documents. As late as 1781, New York, in a legislative resolution, allowed only six reams of writing paper for the governor and the legislature. Ten years later the legislature was still struggling with the problem.

Meanwhile prices of paper were high. John Davis, state printer of North Carolina, in 1780 quoted eighty to one hundred pounds per ream. This was undoubtedly a war price. Toward the end of the eighteenth century printing paper sold at from three to three-and-a-half dollars per ream.

The immediate causes of the paper shortage were the cessation of importation at the outbreak of the War of Independence and the flight of papermakers, many of whom were English-born and sided with England.

Colonial governments took active measures to encourage domestic manufacture. Papermakers in many col-

onies were deferred from military service as being essential war workers and were even discharged from the army and ordered back to the paper mills "to help the war effort."

The few craftsmen who could make or repair papermaking machinery and equipment were even more solicitously guarded. When a certain Nathan Sellers, a mould maker of Pennsylvania, joined the continental army in New Jersey in 1776, the continental congress ordered him discharged and returned to the work of making and repairing "suitable moulds, washers, and utensils for carrying on the paper manufactory."

Although paper had been made in the Colonies since 1690, and might well have been made much earlier, if only to supply the extensive printing trade, the relative shortage of paper continued long after the War of Independence. Papermaking had not made much progress in the Colonies and there are indications of repeated business failures.

There is little factual information from which to seek reasons for the backwardness of papermaking. As long ago as 1868, J. L. Bishop, in his monumental *History of American Manufactures from* 1608-1860, wrote that not until 1810 was there any systematic attempt to collect statistics. "The few particulars which can now be gathered, as to the progress made during these two centuries, are scattered through numerous memorials, local histories, records of councils and statutes of assemblies."

But there are several clues as to why the paper industry was slow in getting under way. Benjamin Franklin pointed out that the industry involved organization, specially in the bringing together of specialties. It also required considerable concentration of capital for those days.

There were other obstacles, some of which may no longer be of record. For instance, there was no such thing as free enterprise. Sometimes it took virtually the equivalent of an act of Congress to get permission to go into business.

Lyman H. Weeks, in *A History of Paper Manufacturing*, says "Even though the contemplated mill might be ever so insignificantly small and unimportant, an ambitious man could not go out and invest his capital in site, waterpower and building and proceed to work unrestrainedly. Papermaking was regarded as a sort of public utility—as indeed were other manufacturing industries — and it came under the watchful supervision of the public service commission of that time, that is, the great and general court, or the assembly, or the governor and council, as the authority might be in the different colonies. Permission to engage in business was a prerogative of the Government and a monopoly for an indicated term of years, was asked for and generally included, if the permission was accorded at all. The grant was a ponderous, impressive document, elaborate with specifications and requirements."

Such a charter, entitled "An Act for the Encouragement of Making Paper" was granted upon petition by

A Sixteenth-century paper mill. (From "A History of Paper," 1882.) Reproduced from "The Paper World."

the "great and general court of the province of the Massachusetts Bay," in 1728, to several wealthy and influential merchants of Boston. But even these notables were specifically enjoined by the charter to produce as follows:

First Year: "Two hundred Rheam of good Merchantable Brown Paper, and Printing Paper, Sixty Ream thereof at least to be Printing Paper."

Second Year: "Fifty Rheam of good Merchantable Writing Paper, of equal goodness with the Paper commonly stampt with the *London* arms, over and above the aforesaid two hundred Rheam of Brown Paper, and Printing Paper."

—and so on for ten years.

In short, what the paper industry needed to put it on a firm foundation was, as pointed out by Louis Tillotson Stevenson in *The Background and Economics of American Papermaking*, "The development of the limited liability corporation which flowed from the institutions of private property, free exchange of goods and free enterprise."

Today, more than ever, the paper industry needs large-scale enterprise. But today, large-scale enterprise is threatened more drastically than ever before—specifically, by the possibility that the wartime corporation excess taxation (40 per cent normal and 95 per cent surtax plus taxes on the stockholder's income) will be continued after wartime conditions cease.

Too-burdensome taxation, if carried over into the period of peacetime production, may throttle the corporate form of organization and threaten paper technology at one of its most critical moments in history. Therefore it seems important that the paper industry join in encouraging Congress to remove this hazard to future progress. But no move by industry in that direction can succeed unless the entire public—and particularly the wage earners—clearly understand it.

Wage earners and consumers *will* understand the problem if management employs the lessons of history to demonstrate the close correlation between the well-being of the public and the development of the corporation setup, which has done so much—in the paper industry as well as in other fields—to make present living standards possible.

In 1780, when paper was quoted, as aforesaid, at "eighty to one hundred pounds per ream," and when skilled papermakers were scarce, weekly wages were only about five dollars, and this wage was considered high.

In 1787, the paper mill of Jackson & Sharpless at Redstone, Pennsylvania, employing between twenty and twenty-five persons (possibly including children) has an indicated potential gross production of only $10,000 to $12,000. This would not leave much for wages.

Between 1790 and 1800, at a Berkshire County paper mill, vatmen received $3.50 a week without board. In 1831, the average pay for men employed at paper mills in the same county was $5.40 a week.

Wages for unskilled workmen were considerably lower—for a working day of ten to fourteen hours. Out of some fifty quotations of laborers' wages between 1630 and 1775, practically none falls below 25c, and few exceed 50c, a day without board. The normal summer wage was probably about 35 or 40c. Skilled artisans following a single trade earned from 60c to $1.25 a day.

Wages for women were between one and two dollars a week; for small children, up to one dollar a week.

Here are some specific wage quotations cited by Victor Selden Clark in the *History of Manufactures in the United States:*

In 1775, the daily pay, in addition to board, of 200 laborers employed on the new road through the Cumberland country to the Ohio was 33 cents. In 1812, the corresponding wage of 30 laborers on the State road from Buffalo to Genesee was 46 cents. According to an investigation made early in the last century, the average wage of unskilled workers, without board, in the principal cities of the United States for the first six months of each year mentioned was: 50 cents in 1785; 50 cents in 1790, 95 cents in 1795, 90 cents in 1800, and 75 cents in 1805. As late as 1846, Irish and German laborers, living in shanties built by themselves on contractor's land in Brooklyn, worked during the winter for 65 cents a day, which was also the rate paid common hands at iron works in Baltimore.

Exactly one hundred years ago, the prevailing wage in New York City was only $1.00 a day, the *minimum* workday was ten hours long, and the take-home yearly income of the average worker was only about $248.

Such a wage was not even half enough to maintain a family of five at subsistence level, in spite of the lower prices for commodities which governed at that time. In 1851, Horace Greeley's New York *Tribune* published a budget for such a family that called for $10.37 a week. Two years later, the New York *Times* published a family budget requiring fifty weeks' work at a wage of $12 a week.

To dramatize what the paper industry has accomplished for the average man since that time, compare the typical worker in that field today with the pauperized, overworked laborer of 100 years ago. The modern "unskilled laborer" is seldom a laborer at all in the traditional sense. His manual efforts seldom require much muscular effort. He works in clean, well-ventilated and well lighted surroundings, in good clothes and with sanitary facilities. His wages, for an eight-hour day, are from five to ten times those of a hundred years ago, and with them he can buy—in terms of housing accommodations, home comforts, food luxuries, fashionable clothing, medical services, education, entertainment, and social security—values not available to Nineteenth Century workers, or even to their employers, at any price.

What has happened in the paper industry during the past hundred years to bring about such improvement in the worker's earning capacity? The following tabulation for all industry affords the clue:

Year	Annual Output per Worker	Yearly Wage
1849	$1050	$ 248
1879	1960	346
1909	3180	510
1939	7200	1150

From the foregoing it is evident that the way workers earn more is by producing more. There are contrary viewpoints, however, variously epitomized as by the following typical assertions:

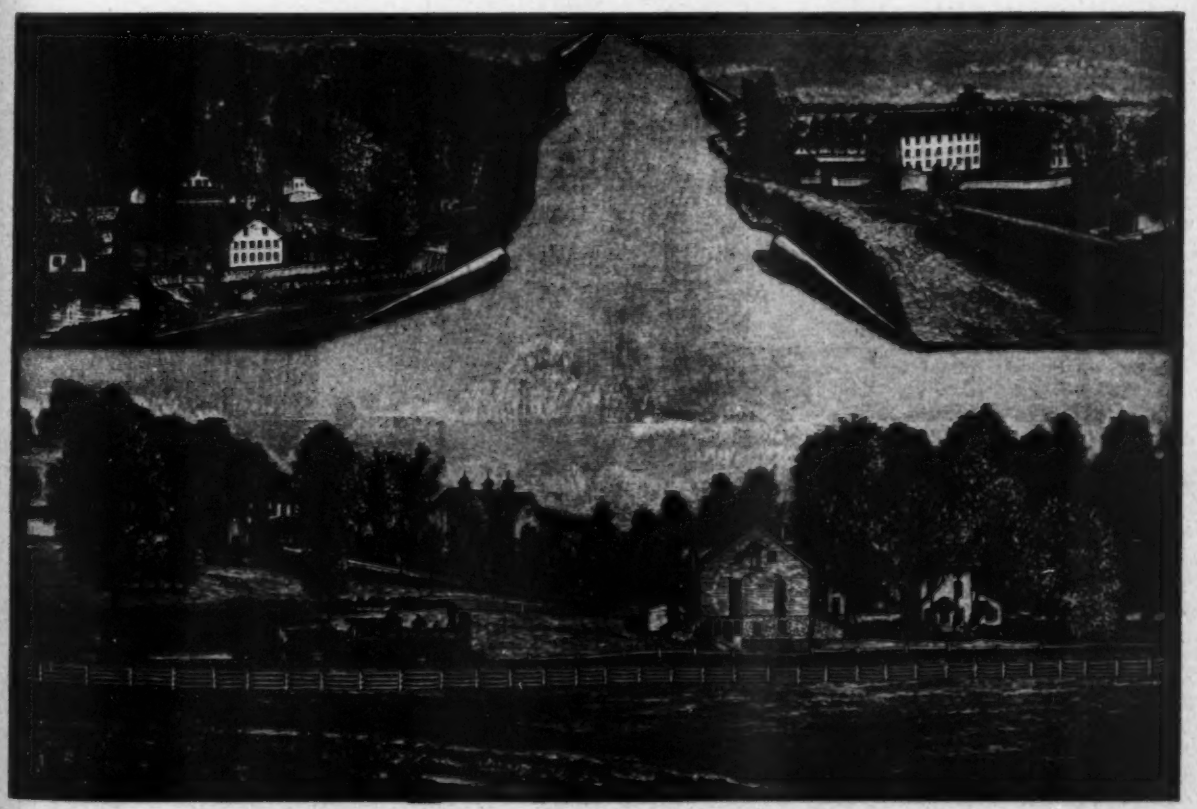
1) *"Sure, more production means more wages, but it also means fewer jobs."*

2) *Technological unemployment is the logical result of scientific advances."*

3) *"What we need is to slow down. If we work too efficiently, we do ourselves out of jobs."*

The test of these alleged truths is to restate them in some specific form and let the restatement reduce itself to absurdity, viz.:

One cotton gin does the work of 18,000 persons. Therefore, the 12,000 new cotton gins installed in the year 1929 alone in our nation of 40,000,000 workers must have put 216,000,000 people out of work—not to



Wilcox's paper mills. Across the foreground, Ivy Mills, erected in 1729. Insets: Upper left—Upper Glen Mills, erected in 1836; upper right—Lower Glen Mills, erected in 1845. (From "A History of Delaware County, Pa.," 1884.)

Vat papermaking in 1881. (From "A History of Paper," 1882. Reproduced from "The Paper World.")

mention persons replaced by the ginning machines installed in other years, and by the spindles, looms, etc.

In industry as a whole, that is, in the entire national economy, it is a matter of simple bookkeeping that wages and production closely parallel one another, even throughout violent fluctuations.

This phenomenon is recorded in the statements of national Income and Expenditures, published annually by the U. S. Department of Commerce, and available in almost any general library in the *Statistical Abstract of the United States.*

In this simple financial statement, the principle items under *income* (which is virtually synonymous with *production*) are as follows: wages and salaries, comprising about two-thirds of all income; farm income, about one-twelfth; business profit, about one-sixteenth; all other income, about one-fifth . . . These income items, plus or minus "savings," equal Expenditures (which are virtually synonymous with consumption).

Whereupon it becomes apparent that any change in total wages, which constitute two-thirds of income, or production, is accompanied by drastic change in business activity. And, with our recently acquired familiarity with the vagaries of business booms and depressions, we also appreciate the possibly more serious secondary effects manifesting themselves in the so-called "vicious spiral" of inflation and deflation.

In recognition of this known fixed relation between wages and prosperity, many able economists have recently been stressing the supreme importance of maintaining through increased per man production, high wage levels and a high level of employment. Among these are such diverse protagonists as Claude R. Wickard, Secretary of Agriculture, Frederick C. Crawford, Past President of the National Association of Manufacturers, and Chester Bowles, OPA Administrator.

But just what has enabled the worker to increase his output so stupendously during the past ccentury? The answer may be found in the following tabulation:

Year	Horse-power Per Worker	Annual Output Per Worker	Annual Wages
1849	very little		$ 248
1879	1.3	$2,000	346
1909	2.9	3,200	510
1939	6.4	7,200	1,150

The increase in horsepower was made possible by the increase in capital investment. Early mills started with as little as $3,000 capital. Around the year 1800, a two-vat mill in Massachusetts required $10,000.

By 1860, the average investment had risen to $25,320. From then, on to 1905, average figures for census periods were: (respectively $51,043, $64,878, $138,412, $219,538 and $364,579.

Even today the productive capacity of workers is said to be a direct reflection upon the capacity of the plant. This is shown in the following table from "Labor Cost of Production in the Paper and Pulp Industry," by J. P. Hagenauer, a Report of the Technical Association of the Pulp and Paper Industry, February 18, 1935.

Tons of Production Per Productive Worker

Capacity Class Tons per day	Tons per man
0-10	1.18
11-25	2.13
26-50	3.87
51-100	5.92
101-200	6.82
200 and above	8.30

But what has made possible the procurement and employment of increased capital investment? The answer is—the corporation.

Far more important than any single scientific discovery or invention, the corporation is the one indispensable tool of the industrial age. By co-ordinating men, materials, machines, methods, and money under management, the corporation provides the means and the medium for the efficient use of capital. It facilitates the large-scale application of horsepower to the efforts of workers, and thereby increases their output. By increasing the output of workers, it enables them to earn more than otherwise would be possible.

These principles apply more pertinently to the paper industry than to most of the process industries. It may not be true that history repeats itself, but it is conceivable that history might reverse itself. And, in an economy as sensitive as ours, it would be a serious menace to the American standard of living to charge any appreciable tendency toward the curtailment of the production of paper and toward decreasing labor wages under present day conditions. Plainly, if investment in factories and production aid grows, workers' output and wages will grow. But if investment in production aids decline, output, jobs, and wages will most certainly decline with it.

To build up small, successful corporations so that they can provide workers with the tools to produce more and earn more, we must have more *investment* capital.

To bring new inventions and ideas out of the laboratory and into production, we must have more *risk* capital.

Today's high double taxes on corporate earnings and personal surtaxes were planned to "take the profit out of war." If allowed to stay unchanged, they will *take the prosperity out of the peace.*

WHAT ABOUT PAPER IN 1945?

W. LE ROY NEUBRECH, Chief, Pulp and Paper Unit
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▶▶▶ DEMANDS FOR the products of the United States pulp and paper industry during the entire year 1945 will continue substantially above both production and import supplies. It is well known that current and near future civilian demands are well above current consumption levels because of limitation orders restricting use, and military requirements are expected to continue heavy even though the European war ends during the year.

Should some supplies of European pulp enter the United States market during 1945, creating a possibility of stepping up paper output, undoubtedly there would be pressure to modify some of the limitation orders on the consumption of paper, thereby tending to counterbalance any production increases or any diminishing in military requirements.

In attempting forecasts for 1942, 1943, and 1944 there seemed little anticipation that either of the two major wars would end in those years. But for 1945 there *is* expectation that the European war can be terminated within the year. Thus, there is this new uncertain element in forecasts for the current year.

What would be the effect upon paper demand and supply if the European war ends this spring or summer? As long as the Japanese war continues, and for even some time following, the military requirements for paper and paper products will continue heavy, but there will be some probable slackening off within 2 or 3 months after the collapse of Germany. However, it is not believed that the easing of military requirements during the year 1945 will be of major consequence. Civilian demands undoubtedly will continue at their present high level, greatly in excess of supplies available for civilian consumption. But on top of this will continue to be the needs from many of the United Nations, as well as from most of the liberated countries, for both pulp and paper.

Anticipation that northern European pulp and paper will be a complete solution in meeting world demands immediately after victory in Europe is being too optimistic. Notwithstanding the availability of Swedish pulp, and to a lesser extent of paper now in storage awaiting shipment, there are bound to be delays in transportation and perhaps problems in determining which countries should have preference on the first cargoes. At any rate, if the European war does not end until the summer or fall of 1945, it is not likely that supplies of pulp of any noteworthy quantity could be landed in the United States much before the end of 1945 to supplement our presently tight market situation. Furthermore, it is reported that Swedish pulp interests will voluntarily ship pulp produced for export in approximate proportion to prewar sales to various world markets, which means about 40 per cent of exports to the U. S., about 50 per cent to Europe and about 10 per cent to South American and other world countries. British interests already have contracted tentatively for about 410,000 short tons of Swedish pulp now in inventory for shipment as soon as possible after the war.

The demands for both pulp and paper from domestic output would be indirectly eased during this transition period because such shipments made from the northern European countries to England, France, and other world markets customarily supplied from north Europe, would lend a helping hand to balancing the world's requirements for pulp and paper with the available world's supply.

Since Pearl Harbor, the paper industry has been confronted with one problem after another affecting the procurement of adequate raw materials and operating equipment and supplies. Such problems have ranged all the way from chlorine and starch to fuel oil and fourdrinier wires. Each problem, as it came up, was met squarely through co-operative efforts of the industry and the War Production Board, and adequate adjustments made with the result that the net effect on production was indeed minor. The most important of all these problems was the over-all one of sustaining a steady flow of fibrous raw material in terms of pulpwood and wastepaper.

Whether or not wood pulp and paper capacity expansion in the United States will be proportionate to expansion in certain other countries in the next several years will depend upon international economic developments. Trade barriers could artificially restrict the international flow of these products and at the same time prohibit an increase in the consumption of paper and pulp in various countries throughout the world.—From "The World's Paper and Wood Pulp Industry Before and After V-E Day."

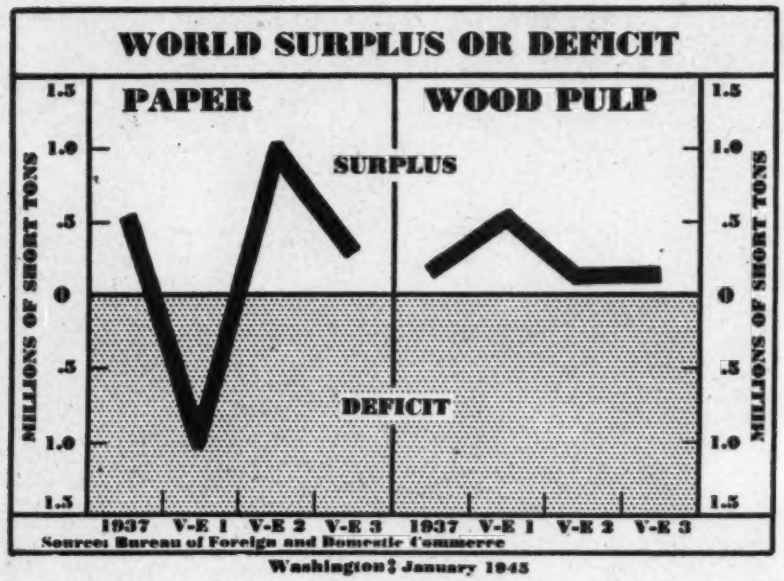
In 1945, manufacturers undoubtedly will continue to be confronted with either old or new problems and the life of the paper mill executive will not be an easy one. At the very start of the new year unusually severe winter weather throughout the northeastern region resulted in rail freight embargoes and logging difficulties, typing up of the movements of raw materials as well as finished products.

Labor probably will be the major difficulty in 1945. Selective Service, War Manpower Commission, and the United States Employment Service regulations will be subject to change as long as active war continues. Such changes are likely to result in a more stringent civilian labor market. At present, only labor employed at pulpwood cutting and wood pulp production are included on the WMC critical activities list. It is reported that industry has requested inclusion of items in the paper and paperboard field which are urgently needed by the military.

During the past year or more the history on labor regulations has been largely one of a gradual inclusion of specific and important occupations finally reaching a climax when all these regulations were abolished and a new start made. This is obvious from the revised WMC regulations issued on January 16, 1945.

There will not be any likely change in the truck and tire situation during 1945. In fact, with thousands of commercial trucks of various enterprises reaching a "junk" stage it could easily develop that the medium and light truck situation will grow worse rather than better. Freight cars and locomotives are also showing signs of heavy usage and in view of expected heavy freight movements westward to amplify the Japanese war after the close of the European conflict, no easing in the rail freight situation can be counted upon.

Notwithstanding the combined ef-



forts of federal and private agencies to stimulate the production of pulpwood and the salvage of wastepaper, the industry will be fortunate indeed if the records for 1945 equal 1944 figures. Yet only through a substantially larger supply of such fibrous raw materials could the industry expect to produce a large quantity of paper and paperboard than was manufactured in 1944. In fact, the 1944 output probably will be difficult to equal this year unless weather conditions throughout the year as a whole are substantially better than seasonal and no unusual stormy or wet weather conditions curtail logging operations, particularly in the South.

It is important to keep in mind that the experience of the past 2 or 3 years has demonstrated that full practical operating capacities of pulp mills for a successive 12 month period are extremely difficult to achieve, especially in view of the low pulpwood inventory positions of many mills at the present time. The high level of domestic output in 1942 of 10,783,000 tons of pulp was possible through the absorption of inventory wood coupled with relatively fewer problems in terms of labor and general operating conditions. Total United States pulp production fell to 9,658,000 tons in 1943 largely because of insufficient wood supplies, but rose to 10,087,000 tons in 1944 as the result of improved pulpwood receipts brought about through the outstanding co-operative effort of industry and the War Production Board.

On the other hand, it is noteworthy that aggregate production of paper and paperboard in 1944, amounting to 17,183,000 tons was moderately greater than in 1943 when 17,036,000 tons was produced, whereas the total consumption of pulp in the production of paper in 1944 was about 117,000 tons less. This is readily explained by a proportionately larger output of paperboard which utilized a substantial percentage of wastepaper in production as well as some increase in the use of substitute fibers in certain grades of paper. Paperboard production in 1944, including building boards, totaled 8,973,000 tons showing an increase of about 350,000 tons over 1943, whereas paper production of 8,210,000 tons showed a decline to slightly more than 200,000 tons below 1943.

Analysis of paper production in 1944, as compared with the previous two years, shows an upward trend in special industrial papers, shipping sack paper and absorbent paper. Sanitary papers remained about constant but substantial declines were recorded in other classes. For paperboard there was a decline only in setup boxboard, with container, folding boxboard and certain specialty boards, such as tube stock, showing substantial increases.

It is apparent that these recent trends in production by major grades of paper have been brought about through increased direct and indirect military needs coupled with orders from the Forest Products Bureau of the War Production Board directing the production of a "must list" of papers to meet war needs, balanced against curtailments on other less essential grades.

Modern warfare has called heavily for adequate supplies of packaging materials, especially container board and folding boxboard, tube stock, and other special grades as well as for types of wrapping papers. In addition, the military needs for other types of paper have continued to grow thereby diminishing the supplies available for civilian consumption. As the intensity of the war effort has progressed, the military has taken increasingly larger percentages of such grades as bond and writing paper, bristols, duplicating and mimeograph paper, manifold paper, offset paper, kraft wrapping paper, and toweling and toilet paper.

Even in the case of newsprint the military is absorbing larger quantities, especially for overseas shipments to the fighting front and the liberated areas, so that the press of these countries can make available to the liberated peoples the developments of the war and rehabilitation plans and policies of the United Nations.

It would seem that one of the major problems likely to develop in 1945 is a repetition of the optimism which prevailed during the late summer of 1944 that the war would soon be over and that production efforts could be slackened. A repetition of this psychology could well develop in 1945 should the European war come to a climax in the spring or summer. Results of a general letdown through a desire to prolong the celebration of this occasion might easily result in the loss of a substantial production of pulpwood and the salvage of wastepaper and in consequence a general loss of wood pulp and paper output. Such a development would be serious since the prosecution of the Japanese war will mean that a steady flow of pulp and paper must be produced. Should such a slackening in output occur, it could mean only one thing, further restrictions and curtailment of supplies for civilian uses.

It is urgently recommended that all pulp and paper manufacturers analyze their market potentialities in the period immediately following the close of the European and Japanese wars. It would be expected that their conclusions in general would resolve themselves toward an anticipation of continued heavy demands for their products and for these reasons the end of either or both wars should not mean a lessening in production incentives. In this connection, pulp and paper mill executives may find useful the recent report of the Pulp and Paper Unit, U. S. Department of Commerce, "The World's Paper and Wood Pulp Industry Before and After VE Day" which sets forth an analysis of anticipated conditions for the world as a whole and for the United States separately (*see chart above*).

Sulphate Turpentine . . .

a Review of the Literature*

T. T. COLLINS, Jr.,[1] and M. G. SCHMITT[1]

▶▶▶ MOST INVESTIGATORS are in fair agreement as to the main constituents of sulphate turpentine from which the undesirable impurities have been removed. Blengsli (*66*) has said that today less than 5 per cent of the components remain unknown.

Chemical and Physical Properties

In his early work with sulphate turpentine, Klason (*30*) found refractionation of the oil from spruce wood to yield a fraction of 155-158 C. boiling point with a specific gravity of 0.8601 and demonstrated the presence of pinene by conversion of the turpentine to pinene hydrochloride. Fosse (*45*) prepared both pinene-nitrosochloride and pinene-hydrochloride from sulphate turpentine and showed both sylventrene and sesquiterpenes are also present.

Bergstroem (*41*) pointed out that sulphate or soda turpentine oil from pine is dextro-rotatory whereas that from spruce by the same pulping process is levo-rotatory. He also found that certain fractions of these oils do not give color reactions in tests for food turpentine.

Halse and Dedichen (*33, 48*) made very detailed analyses of the various fractions from purified sulphate turpentine. They found that the main fraction (about two thirds of the oil) consists of dextro-rotatory alpha-pinene which is not changed in the sulphate process as it is in the sulphite cooking process. Dextro-rotatory beta-pinene and probably dipentene also are present in other fractions for which the authors give detailed physical data. They remarked that the beta-pinene which occurs naturally is levo-rotatory. The alpha-pinene they identified by conversion into pinonic acid and bornyl chloride and the beta-pinene was oxidized to nopic acid.

The following data are part of that given by Halse and Dedichen (*33*) for the main fractions of purified sulphate turpentine:

	Boiling Point (deg. C.)	d_{15}^{15}
Alpha-pinene ...	155-156	0.8642
Beta-pinene	164-166	0.8650
Dipentene	175-176	0.8500

They have given structural formulas for alpha-pinene and beta-pinene, while Wise (*67*) has illustrated the formula for dipentene. All these substances have the formula $C_{10}H_{16}$ (Figure 1).

Aschen (*68*) had earlier found a terpene in sulphite turpentine of physical properties similar to those of beta-pinene except that it was dextro-rotatory and gave no nopic acid on oxidation with potassium permanganate. He (*69*) later studied the various fractions of sulphate turpentine, particularly the higher boiling constituents and compared them with turpentines from other sources. However, Weissner (*1*) claimed that the occurrence of such oils in sulphite turpentine is the exception to the rule.

Halse and Samuelson (*24*) pointed out that alpha-pinene from pine is dextro-rotatory, while that from spruce is levo-rotatory. They have given distillation curves for sulphate turpentine as well as the oil from other sources and in testing for alpha-pinene oxidized it to pinonic acid with potassium permanganate and isolated its semicarbazone.

Rodowski (*5*) has given the following general information concerning refined sulphate turpentine:

Specific gravity	0.865
Distillation 154-162 C.	98 per cent
Flash point	97 Fahr.
Unpolymerizable matter	0.5 per cent

According to one source (*38*), sulphate turpentine is 50-60 per cent turpentine and 20-10 per cent pine oil (terpineol). Veitch (*70*) has mentioned that purified sulphate turpentine is 90-97 per cent alpha- and beta-pinenes while Baroni (*71*) and Bray (*72*) stated it is mostly alpha-pinene. Another source (*73*) listed the oil as having a beta-pinene content of 25-30 per cent with the residue being alpha-pinene. Postovski and Plusnin (*54*) have given some physical data on sulphate terpentine and found it is 90 per cent alpha- and beta-pinenes with not in excess of 1 per cent dipentene. Soda turpentine on distillation gives 65 per cent pure spirits and 35 per cent pine oil according to Dupont (*36*).

As Wise (*39*) has pointed out, the various species of trees contain varying percentages of different turpentine oils and this undoubtedly accounts for the differing compositions of turpentines, depending on which woods are pulped. Klason (*30*) found the residue after steam distillation of sulphate turpentine consists of brown polyterpenes. Qvist (*74*) studied the contituents of the residues of sulphate turpentine oil distillations and found cis-terpin, i-borneol, and d-borneol. No iso-borneol was present as there is in sulphite turpentine and it was suggested that this is probably due to the difference in woods rather than the different cooking processes.

According to Weissner (*1*), it is difficult to distinguish sulphate from gum turpentine if the former is well purified and the sulphate odor has been removed. When it is not possible to detect the difference by the odor test alone, proof of the presence of sulphate turpentine in the sample may be had by the method of Smith (*75*) in which the sulphur and chloride content are determined. Sulphur characterizes sulphate turpentine but not gum, steam-distilled, or that produced by the soda pulping process. Chloride is also characteristic of this grade, depending on whether or not the turpentine was refined with hypochlorites. Smith's tests (*75*) showed purified sulphate turpentines from various sources had 0.011 to 0.017 per cent sulphur and some contained as high as 0.28 per cent chloride whereas turpentine from other sources did not contain these two substances. It was found also that the sulphur occurs mostly in the lower-boiling fractions of refined turpentine, as shown by the following table:

Fraction	Per cent Sulphur
Distilling below 156 C.	0.030
Distilling below 156-158 C.	0.008
Distilling below 160-162 C.	0.004

Sulphur was determined quantitatively by the Kennedy sulphur lamp using A.S.T.M. Method D-90-26T. Chlorine was determined by passing the gases of combustion from turpentine through an acidified silver nitrate solution. Another method for determining the sulphur content of turpentine, the procedure of F.

(*) This is Part II and concludes the article. Part I was published in the December (1944) issue of this magazine.

(1) Thilmany Pulp and Paper Company.

Schulz described by Loebell (Lunge-Berl, chem. techn. Undertsuch., Part III) has been used by Rönnholm (*53*). It is of interest to note that one patent (*60*) has stated that sulphate turpetine purified with lime chloride bleaching powder does not give a chlorine reaction with copper wire.

Klinga (*14*) determined the purity of sulphate turpentine by fractional distillation as well as by observing its behavior with caustic soda solutions and sulphuric acid.

It is perhaps a good thing that sulphate turpentine is always listed as such even after it has been purified so that no misunderstandings will occur from its use. According to one source (*38*), the product sold in the United States must be labeled "Sulphate Wood Turpentine" and should conform to sulphur and chlorine content within certain limits. Veitch (*70*) and Grotlisch (*76*) mentioned that the Federal Naval Stores Act of March 3, 1923, regulates the marketing and labeling of sulphate wood turpentine by requiring that it be designated or described by that full name, both on labels and invoices. Grotlisch (*76*) stated that according to Regulations for Enforcement of the Naval Stores Act, the material must meet Specification LLL-T-791b of the Federal Government which covers all turpentines.

A.S.T.M. Standard D-233-36 (*77*) concerns the sampling, detection and removal of separated water, appearance, odor, specific gravity, refractive index, distillation range, and polymerization in the presence of sulphuric acid of the various grades of turpentines, including that produced by the sulphate process.

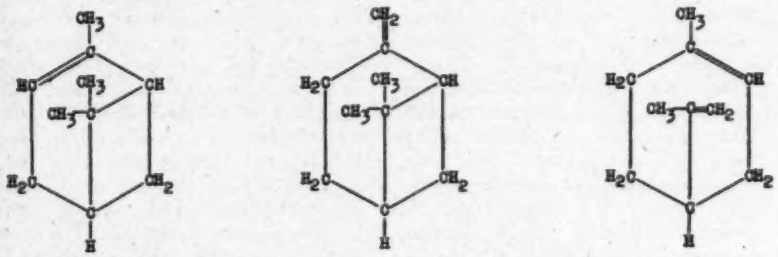


Figure 1—Constituents of sulphate turpentine

By-Products and Uses

If the production of sulphate turpentine increases and purified grades are marketed to a greater extent, it will find more widespread use as a substitute for the more expensive gum turpentine and will be important as a low-priced source of alpha- and beta-pinene. The greatest detriment to more diversified use of sulphate turpentine in the past has been its obnoxious odor but there appears to be no reason, other than that of economics, why that cannot be eliminated as a general criticism of the better grades of the refined oil. Undoubtedly, both crude and refined sulphate turpentine have been used in the past for various purposes which have not been mentioned in any publications. However, the few major uses are, in general, well known.

One of the large purchasers of crude sulphate turpentine today is a paint manufacturer who evidently purifies the oil and utilizes it in paints and varnishes. Dupont (*36*) stated that distilled soda turpentine is suitable for use in paints without any further treatment.

In Russia, Postovski and Plusnin (*54*) have found that the purified oil is suitable for pharmaceutical purposes and for use in paints. Grotlisch (*76*) stated that in the United States only gum spirits of turpentine can be dispensed for medicinal use.

In his review of the uses of purified sulphate turpentine, Weissner (*1*) claimed it is a suitable substitute solvent for resins, fats, and oil colors in the varnish industry to replace gum turpentine. He also mentioned the commercial preparation of camphor from the pinene of sulphate turpentine by various methods using pinene hydrochloride as the starting material. The residue oil from the camphor distillation is sometimes used as "decamphored or regenerated turpentine." Wegner (*78*) has found that when sulphate turpentine residues are heated under reflux at 160 C. with sodium bisulphate and then heated to 230-250 C., a "light turpentine" is produced. Luttringer (*4*) stated that both the dimethyl sulphide separated from sulphate turpentine or its nitric acid oxidation product are suitable solvents for nitrocellulose.

Romaine (*35*) listed sulphate turpentine as being useful in the manufacture of terpin hydrate, terpineol, and synthetic camphor. Hasselstrom (*79*) has patented the conversion of sulphate turpentine, among other grades, into terpin hydrate, monocyclic and bicyclic terpenes, and hydrated terpenes known as pine oil by treatment with pseudo-pimaric acid sulphonate or sulphonated rosin derivatives. The inventor has given physical data concerning the various terpene fractions produced and stated that the bicyclic terpene fraction is of value as a paint and varnish solvent. Hasselstrom (*80*) later mentioned the conversion of sulphate turpentine into terpineol (synthetic pine oil) by means of sulphuric acid treatment with the residues being converted to cymene and its derivatives, menthol or carvo-menthol, or sulphonated emulsifying agents. He claimed that chlorination results in the production of perchloroterpenes and polychlorotoluenes and that sulphate turpentine can be classed as a starting material in the production of myrcene and allo-ocimene which are constituents of a new type of synethtic rubber. Schrauth (*81*) has patented the production of maleic acid from sulphate turpentine oil by catalytic oxidation in the vapor phase at high temperatures.

One potential use of sulphate turpentine that some mills might find of value in their pulping processes, is as an "introfier." Remler (*82*) has patented a process for using an "introfier"; such as, turpentine, with alkaline cooking liquors, claiming that it increases the liquor penetration into the material to be cooked and decreases the cooking time, the washing time, and the alkali required, in addition to resulting in a more uniform pulp. According to Dupont (*36*), Rinman proposed the addition of turpentine to boiling sulphate cooking liquor in order to help dissolve the resin in the wood, such method being applicable only when the wood has a resin content of less than 2 per cent.

In some European countries, the use of sulphate turpentine as a fuel for internal combustion engines undoubtedly has become feasible. Foulon (*59*) has mentioned its use mixed with gasoline, and Rönnholm (*53*), in Finland, has studied the possibilities for the use of crude oil of turpentine as a motor fuel and found that the burning of the sulphur-containing impurities results in the formation of sulphur dioxide and sulphur trioxide which, together with water vapor, form sulphurous and sulphuric acids. These corroded the metal parts of the engine and accumulated in the oil in the crankcase. In addition, the water content of the crude turpentine was found to be troublesome in cold

weather and a pitch accumulation on moving parts of the motor reduced the oiling efficiency of the lubricating oil by an undesirable degree. However, these difficulties were somewhat minimized by partial purification of the crude turpentine and a reduction of its sulphur content to ¼ of its original value.

Rönnholm (*53*), also observed that from the point of fuel value, turpentine is comparable with gasoline and benzene and is superior to the alcohols sometimes employed as motor fuels.

Fuel	Fuel Value (Kg. Cal./Kg.)
Gasoline	11,400
Turpentine	10,800
Benzene	10,026
Ethyl alcohol	7,140
Methyl alcohol	5,365

A recent note (*73*), of more than passing importance, has reviewed the outlook for the use of sulphate wood turpentine for the production of beta-pinene which is used in the manufacture of artificial resins. It was estimated that 5,000 barrels per month of sulphate turpentine were being used in the production of this material in 1943, and it was said that the demand for beta-pinene eventually will exceed the supply unless a cheap method for its synthesis can be worked out. According to this source, approximately 25-30 per cent beta-pinene is recovered from sulphate turpentine with the residue being alpha-pinene which is suitable as a paint and varnish thinner. The statement also was made that synthetic camphor is now being manufactured in the United States from alpha-pinene from sulphate wood turpentine.

Production and Market Prices

In reviewing the economic outlook for sulphate turpentine recovery, Romaine (*35*), in 1939, mentioned that although sulphate turpentine has been produced in Norway and Sweden since prior to 1910, it was not produced in other than experimental quantities in the United States until after 1918. Because of the difficulties in the purification of this material, its production before 1929 was not in excess of 4,000 to 5,000 barrels per year. Another source (*83*) has estimated domestic production in 1937 as being 25,000 barrels, while Sweden produced 35,000 barrels and the rest of the world only 10,000 barrels. Peterson (*34*) has given approximately these same figures for world production.

If the potential production of 100,000 barrels of sulphate turpentine in the United States, mentioned by Peterson (*34*) in 1939, is considered as being the limit, then it can be seen from present figures that the limit of production almost has been reached. However, Bray (*72*) has quoted Blengsli (*66*) to the effect that it is possible to recover 220,000 barrels annually, and Wise (*67*) has set the maximum figure as high as 250,000 barrels.

Production of turpentine in the United States, 1927-1944

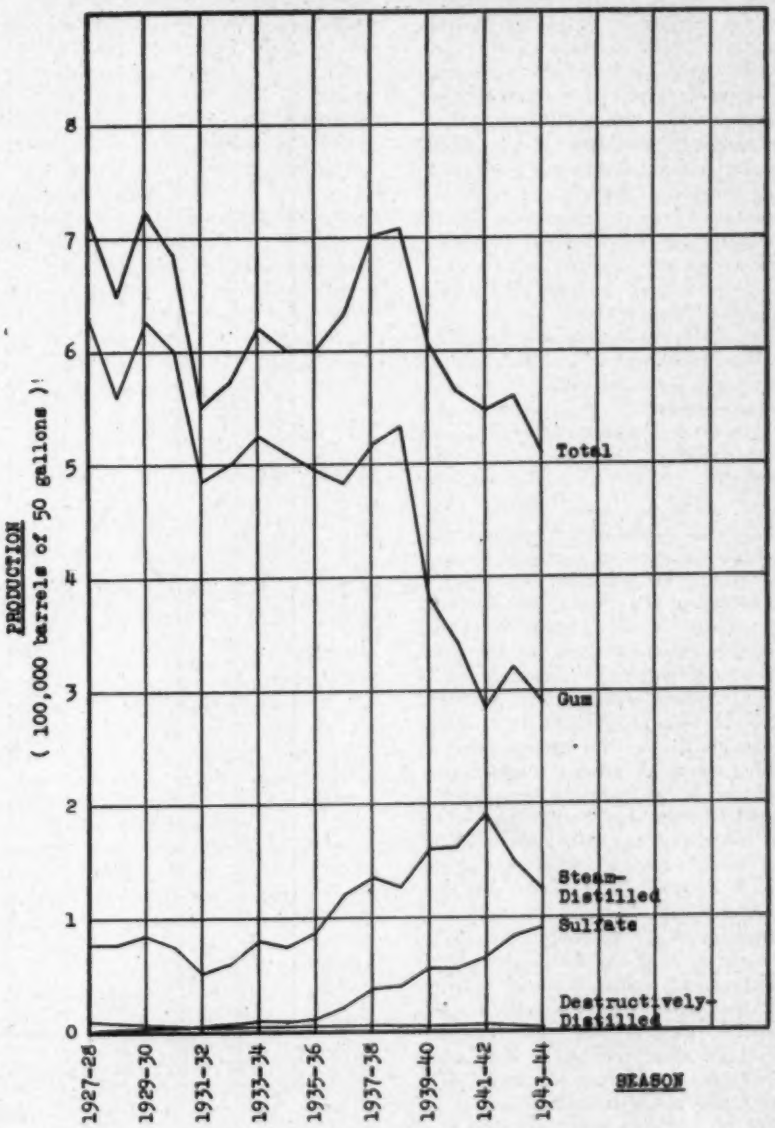


Figure 2

In order to present a more complete picture of sulphate turpentine production compared with that of other grades, a chart (Figure 2) has been prepared from data supplied by Goldblatt (*84*) to show the production of gum spirits, and the wood turpentine grades: sulphate, steam-distilled, and destructively distilled.

This data shows the considerable increase in sulphate turpentine production within the past ten years and allows visualization of its importance compared with the other grades produced. However, it would be optimistic to expect production to continue increasing at the present rate much longer because there may be no great increases in the tonnage of kraft pulp manufactured within the next few years and because today the largest mills which are pulping the richest turpentine-bearing woods, like the southern pines, are evidently recovering most of their by-product turpentine. In addition, as more hardwoods are utilized in the kraft process, the over-all yield of turpentine per ton of pulp will be decreased. A

similar decrease in average unit yield will occur as a result of an increase in the number of turpentine recovery units in the northern kraft mills which pulp a considerable proportion of hardwood, as well as relatively poor turpentine-bearing conifers.

Although reduction of the obnoxious odors produced by the kraft cooking process is desirable in many instances and can be accomplished partly by collecting the sulphate turpentine, the factor of price has had considerable influence. In addition, if one looks at this material in its crude state, from the consumer's standpoint, it is, as Hasselstrom (*80*) pointed out, a chemical raw material of great interest because its price is invariably much lower than that of the turpentine produced by the naval stores industry.

In an early paper, Helin (*15*) studied the economics of sulphate turpentine recovery and outlined the cost of refining the crude oil. Foster (*17*) and Ogden (*16*) have also discussed this phase of the matter and based their calculations on a market price for crude sulphate turpentine sufficient to show a profit in its recovery.

It has been rather difficult to secure complete data on the market price of either crude or refined sulphate turpentine as it had not been offered regularly and had not been classed on the market as a general commodity. Evidently a considerable portion of the crude oil produced in the past has been purchased by one firm which is reported to pay approximately 20 to 25 per cent of the Savannah market price of gum spirits, depending on the distance from the pulp mill to turpentine refinery, and, since it is refined by them for use in their own products rather than for resale on a wholesale basis, naturally there is no way of knowing their upcharge for handling and refining.

Since the chemical market journals have contained so few sulphate turpentine price quotations in the past, the authors have attempted to get more exact data for publication by contacting a number of producers, refiners, or consumers of the oil. The results of this survey were disappointing although a few sources were cooperative in giving what little price data they had available. The responses to the questionnaire can be grouped as follows:

A) No answer to inquiry	7
B) Would give no data	12
C) Price data supplied	3

In addition, the Office of Price Administration (*85*) has stated that individual producers and resellers' prices for sulphate turpentine vary considerably, depending on the prices charged at the time the General Maximum Price Regulation went into effect. This freezes all maximum prices at the highest level attained during March, 1942.

Some price data on sulphate turpentine, as well as the market prices for steam-distilled and destructively-distilled turpentines have been obtained from the *Oil, Paint, & Drug Reporter* (*86*) while the yearly averages of the Savannah market for gum turpentine for the chart shown in Figure 3 are from the 1943-1944 *Annual Naval Stores Report* (*84*). The value of the total quantity of sulphate turpentine produced in certain periods has been published by the Bureau of the Census. (*87*).

As can be seen from the meager data available relative to sulphate turpentine, the price of this turpentine, in the crude form, has been very low compared with that of the other grades. In 1939, the crude oil was forced down to such a low price level that one mill, and probably others, found it more advantageous to use it as part of the fuel in a lime kiln rather than assume the expense of shipping it to a subsidiary refining plant. This means it was such a "drug on the market" that its price was comparable with that of fuel oil, around $0.05 per gallon.

Average market prices of turpentine in the United States, 1928-1944

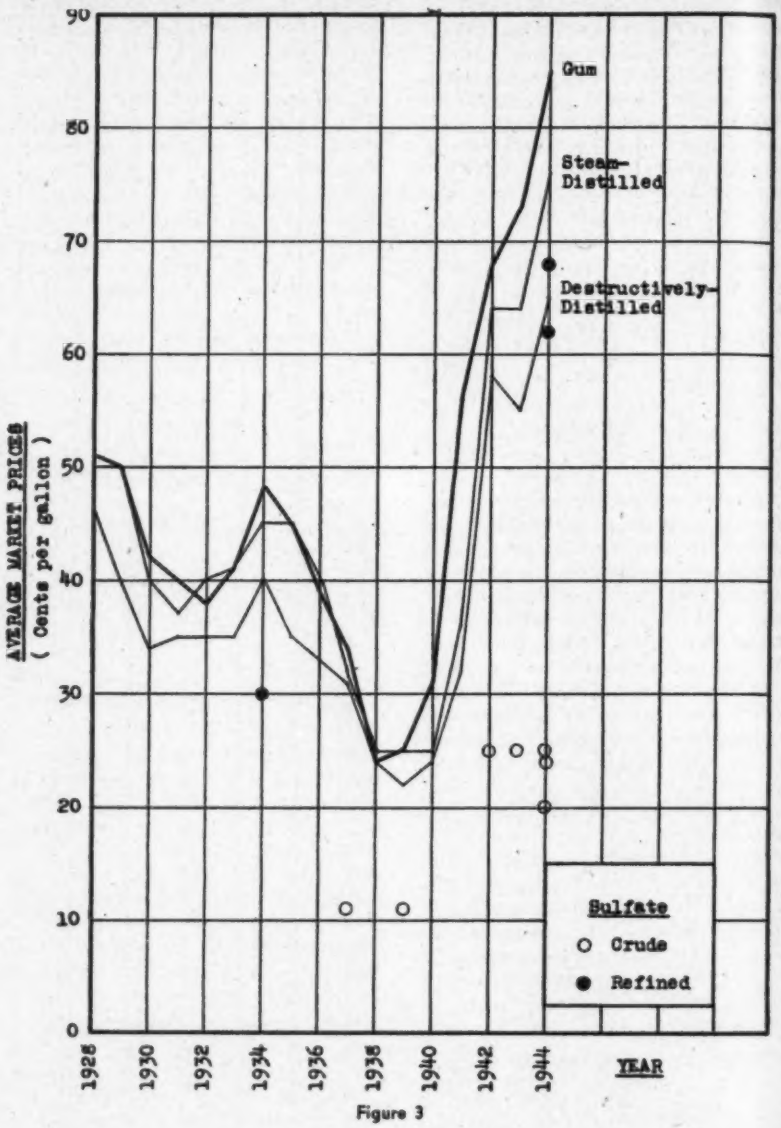


Figure 3

Conclusion

Although the literature of the past has shown sulphate turpentine to be an interesting material, chemically, nevertheless considerable emphasis has

been placed upon its undesirable odor and the necessity for complete purification of the crude oil to make it acceptable for many uses. That even today, refining is not being carried out to the desired extent under wartime conditions is quite evident, as various paint dealers have reported complaints to the authors describing workmen becoming temporarily ill when using paints mixed with so-called "refined" sulphate turpentine in closed rooms. Examination of the sulphate turpentine from one of the rejected drums showed that it still retained much of the odor of the crude oil. Although enough industrial uses to absorb our total production of sulphate turpentine eventually may be found in which the unpleasant odor will make no difference, nevertheless the expected public acceptance in normal times of this grade as a substitute for gum turpentine for many uses; such as for thinning paints, etc., will not develop if extreme care is not taken in its refining. In addition, the more widespread acceptance of petroleum thinners in the paint and varnish industry will force the gum turpentine and its substitutes to more competitive price levels.

When considering the production of sulphate turpentine, it is evident that there are still many mills which do not recover this by-product but eventually will find it of some advantage to do so, unless market prices or demand again reach the extremely low values of past years. Some operators probably have felt that at the present time it is a patriotic duty to recover materials of this kind formerly wasted and that may account for several new producers in this field. Quite possibly, any new production will be thrown on the market in the form of the crude oil as the more progressive paper mills with their by-products processing plants are already purifying the oil they produce.

The price situation of crude sulphate turpentine has not been very attractive during the past few years and, remarkably enough, it is a product of the paper industry which is a victim of the law of supply and demand with the cost of production having very little effect on the price. Because the crude material is a by-product with many undesirable characteristics, the relatively small number of consumers have been able to buy the oil at sacrifice prices over which most mills have no control because the producers in normal times are more or less forced to sell at any price they can get to dispose of the crude oil. The future prospects for increased prices for crude sulphate turpentine after the war may be improved, particularly if there is any competition for the material between the various industries and the prices of the other grades do not again fall into the lower ranges.

There is no reason why the paper mills which now merely market the crude oil could not derive the maximum benefit and revenue from a co-operative program similar to the following which has been suggested many times before by others:

1) Purification of sulphate turpentine so that its quality will make it interchangeable with gum turpentine for most uses

2) Establishment of central, regional, refining plants

3) Co-operative by-product and use research

4) Centralized marketing

Until some better program is adopted than that which has existed in the past relative to the whole sulphate turpentine problem, the incentive to recover or process by-product turpentine from the kraft pulp industry will not be very great.

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Right—Log stacker used to pile peeled pulpwood

Below—Chip loft of a Canadian pulp mill

The Canadian Paper Industry Looks Ahead

COLIN HAWORTH

▸▸▸ CONFIDENCE is the keynote of the Canadian pulp and paper industry's approach to today's big question mark — the postwar period. Among leaders of the industry there appears to be little of the excited anticipation which marks some fields.

Perhaps the basis of the industry's confidence lies in two main facts: First—that the Canadian pulp and paper industry "has the goods," the basic products and converting potential; second—that its record during the hectic years of war has proved it can "deliver the goods." Given these, and the long-term tendency for world consumption of pulp and paper to increase, the industry holds what might be considered legitimate hopes for an orderly progress in the postwar years. There is no complacency in this conception of the job that lies ahead; merely a realistic understanding of the future, its possible difficulties and how they may be met.

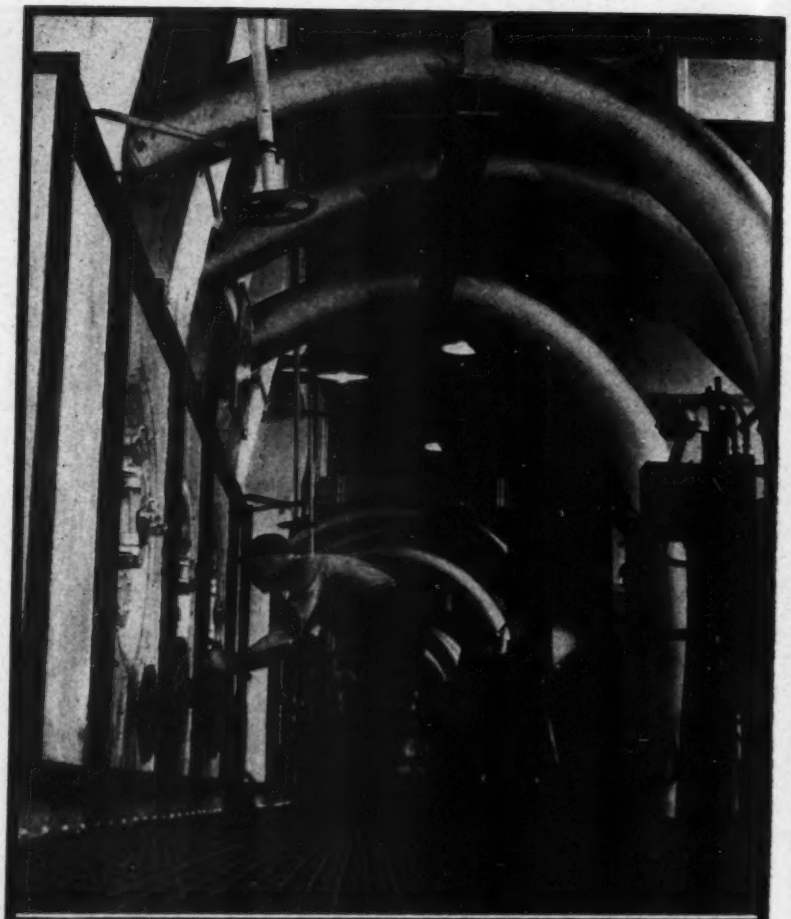
Important in the picture is, no doubt, the fact that this industry, unlike so many others that have played prominent wartime roles, will not be faced with any great reconversion problem. The machinery for war production is the same as for peace. The products themselves are largely the same in war as in peace, save for a few special wartime developments of paper products. The use of pulp as a basis for explosives will naturally be expected to diminish in the postwar era but the development of new products from pulp, plastics for example, will leave little cause for worry from this source.

Coming back to the real basis of Canada's conception of the postwar prospects for pulp and paper there is first the important fact that Canada has the goods. Take the matter of raw material alone—wood. Canada has forests which are surpassed only by the U.S.S.R. and by Brazil in extent, and are much more highly developed as cutting areas. The total forest area of the Dominion is nearly one and a quarter million square miles.

The productive area of this forest expanse is officialy listed as 770,000 square miles, equivalent to the combined areas of the British Isles, France, Sweden, Portugal, the Netherlands, Denmark, and Norway! Of this productive area some 430,000 square miles are considered accessible under present transportation conditions and of that amount, 174,000 square miles are presently leased for industrial purposes, chiefly to pulp and paper enterprises. This leased area, to give a true picture of those figures, is larger than the whole of Poland, and about the size of Sweden.

But wood in the forests is not paper or pulp. It must be cut, and this means *manpower*. Canada with her population of a bare twelve millions may not be considered a large nation, but it is large enough to provide more than 150,000 men who will enter the woods in wintertime to cut wood, something like 10 million cords of it. The rehabilitation of service men in the postwar period will also take many a husky young man into the woods in search of a healthy and well-paid livelihood.

Next most important asset is hydroelectric power, to operate the great machines that reduce pulpwood to pulp. In that factor the Canadian industry has a satisfying prospect, for Canada ranks second among all nations of the world in waterpower. True the industry has been restricted somewhat in its use of power during the war, large blocks of it being diverted to high priority war plants in certain regions, but the pulp and



Power plant in a Northern Ontario pulp and paper mill

paper industry has been the principal factor in the normal peacetime development of the hydroelectric system, its greatest customer, and there is little reason to anticipate it will not continue in that place after the war. Again the power potential of Canada is nowhere near completely harnessed; there is room for expansion if necessary.

Another feature that builds confidence among pulp and paper men of Canada is the capacity of the mills, and their location in the country. Canada is surpassed only by the United States in wood pulp and paper production. In newsprint production, however, Canada leads all other countries of the world by a huge margin.

The newsprint mill capacity of the Dominion (and it might even make Mr. Ripley's eyes pop), is more than four and a quarter million tons a year. This is four times the capacity of any other nation and is equivalent to the mill capacities of the United States, Britain, Norway, Sweden, and Finland all lumped together.

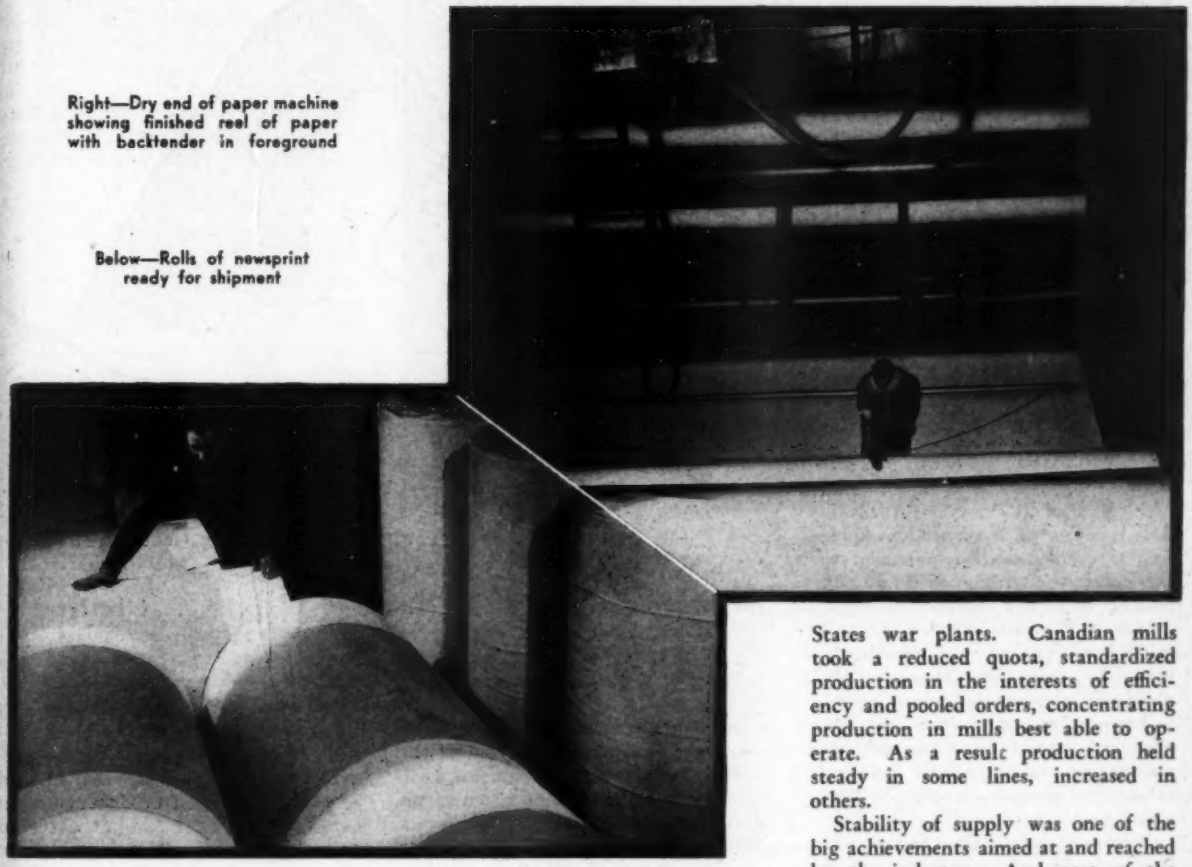
Nearly all of this amount is available for export. Something like ninety-five per cent of the total newsprint production is shipped out of the country each year.

Mess time in logging camp

This great pulp and paper capacity, with which Canada stands ready to serve postwar world markets is drawn from 105 mills spread across the country from the Atlantic to the Pacific, so located that shipments can be made economically not only to the North American continent but to all parts of the world. Some of these mills are pulp producers only, some paper only; other produce both pulp and paper, usually with a surplus of pulp available for outside sale.

Right—Dry end of paper machine showing finished reel of paper with backtender in foreground

Below—Rolls of newsprint ready for shipment



Taken together, these assets give justified confidence in the industry's ability to meet the demands of a post-war world. They are ample evidence that Canada has the materials as far as pulp and paper go.

Behind them stands another asset, intangible but equally important. It is the experience gained in the past five years of wartime operations, the "know how" that has been acquired by Canada's pulp and paper men in meeting demands from the entire free world under the most trying of production and delivery conditions. It is the proof that the pulp and paper industry of Canada can deliver the goods under any conditions.

On the outbreak of war the pulp and paper industry in Canada was young compared to many other enterprises in the Dominion. Yet it was no stripling. In a few decades, the men in this industry had learned well how to make use of the country's natural forest resources. In five years of war they learned how to meet trouble head on and overcome it.

From the very start of war the pulp and paper industry felt the squeeze of the great vise. On one side was the pressure of natural wartime restrictions of its production facilities, its labor and electric power. From the other side came the staggering increases in demands for its products. Demands for paper for military uses alone have been enormous. Pulp was needed in countless tons for nitrating into explosives. Medical supplies, army building board, plastics, synthetic fibers, shell casings, and a host of other items, all come from pulpwood. Newsprint alone was a mountainous problem. With Scandinavian supplies cut off by Nazi aggression, more than 40 nations, practically the whole free world, depended on Canada for paper supplies to maintain a free press! That was one side of the vise.

On the other side was the failing supply of manpower and the difficulty to obtain the needed labor for woods operations. Reserves of pulpwood started to dwindle. But the problem was met. Prisoners of war were pressed into use in some cases; labor campaigns were run with government cooperation urging farmers who form the bulk of the winter-time army of woodsmen to keep up production. In those strenuous times, Canada's cut of pulpwood increased rather than decreased.

Electric power was needed in war plants, some of it exported to United States war plants. Canadian mills took a reduced quota, standardized production in the interests of efficiency and pooled orders, concentrating production in mills best able to operate. As a result production held steady in some lines, increased in others.

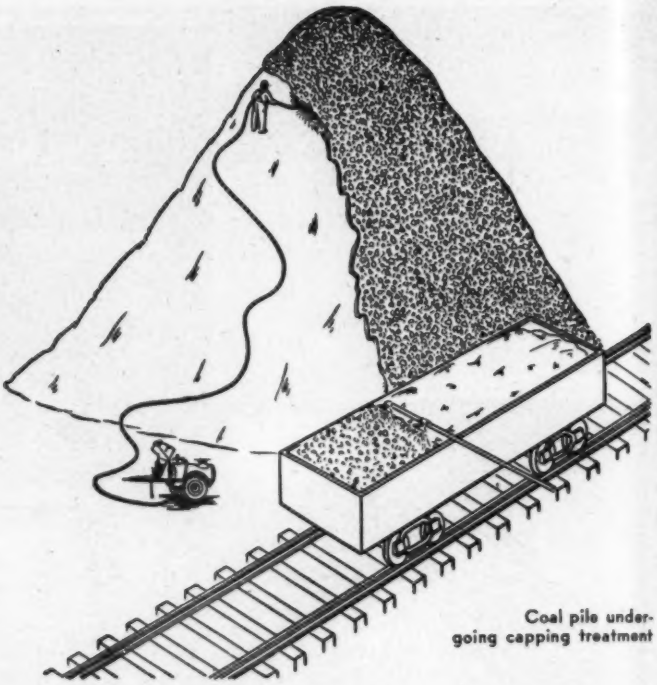
Stability of supply was one of the big achievements aimed at and reached by the industry. And part of the picture of stability was concerned with prices. For the first two and a half years of war, despite rising costs on all sides, the newsprint manufacturers of Canada maintained their product at a New York delivery sale price of $50 per ton, where it had been since January, 1938. During 1943, after official examination of production costs, Canadian and U. S. price control authorities established increases amounting to $8 per ton. Over that period, no other major commodity approached newsprint in price stability.

All this was not done without strain. Anyone in the industry readily will admit the severity of the test, but the general feeling is that the effort has not been wasted. The industry of Canada has shown by its performance in the hectic days of war, qualities of ingenuity, adaptability, and reliability which are an assurance of supply under any conditions, and which, it is believed in the industry, will be recognized as such by potential customers in the days of peace.

It is on this sound basis that the pulp and paper industry of Canada builds its hopes and prospects for the coming postwar period.

Protecting Coal *in Storage*

GEORGE M. WATTLES
Coal Weatherproofing Company[1]



Coal pile undergoing capping treatment

▶▶▶ THE PULP AND PAPER industry consumes a tremendous quantity of coal. Annual requirements of the industry approximate 15,000,000 tons.

During the past several years, most mills have had to pay considerably more for coal than formerly. Yet, during this same period, prices of pulp and paper (especially of paper) have advanced very little — certainly not enough to compensate to any great extent for increases in cost of labor, wood, coal, etc.

Approximately half of the seven hundred odd mills making up the industry are integrated or self-contained, producing both pulp and paper. The remaining mills, for the most part, make only paper or paperboard; a few make only pulp.

In the case of most integrated mills, a good balance between process steam requirements and power needs can be obtained. Because of this peculiarity of the industry, many mills can produce electrical power cheaper than Public Service Companies can afford to sell it.

The qualities of coal presently available to pulp and paper mills are generally inferior to the grades used in prewar days. Many plants have had to use coals of higher sulphur, higher ash, lower ash fusion, and lower B.t.u. content. Caution should be exerecised in the selection of coals available and above all, consideration should be given to the protection of the original mine quality of the coal until it is consumed.

Capping* the outward and upward surfaces of coal in railroad cars and storage piles with a thin moisture-proof and airproof coating or film of material provides the following protection:

1. Spontaneous combustion of bituminous coal is prevented.

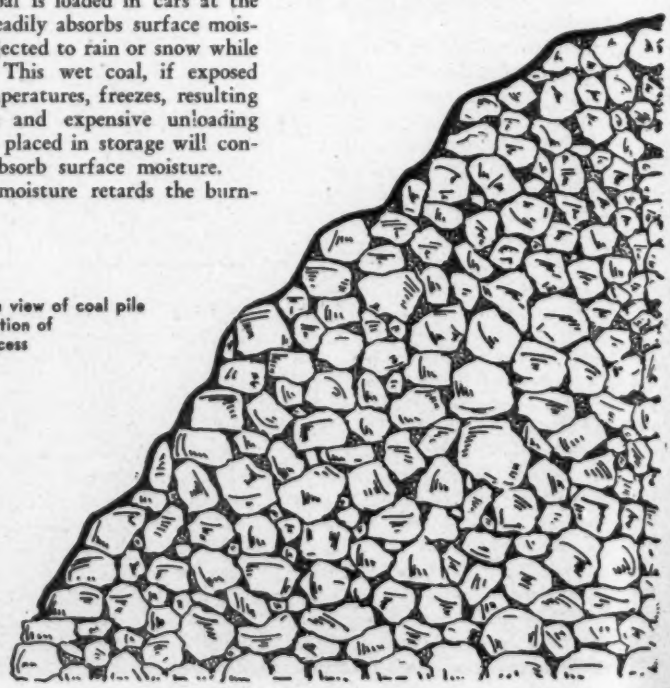
The capping of bituminous coal piles does not permit air to enter or leave them, and therefore, spontaneous combustion is not possible. In fact, cases are on record where capping has extinguished fires that existed at the time coal piles were covered.

2. Surface moisture nuisance is eliminated.

When coal is loaded in cars at the mines, it readily absorbs surface moisture if subjected to rain or snow while in transit. This wet coal, if exposed to low temperatures, freezes, resulting in difficult and expensive unloading costs. Coal placed in storage will continue to absorb surface moisture.

Surface moisture retards the burning of coal. It is especially objectionable in pulverizing coal plants and with spreader type stokers. In one actual test in a pulverizing plant, an increase in efficiency of 25 per cent was obtained when coal kept dry by the capping process was burned in place of the same coal that had been stored without protection.

3. Capping prevents windage or blowage loss.



Cross-section view of coal pile after completion of capping process

(1) Located in Marinette, Wisconsin.
(*) Method known as "Drikapt," patented in United States and Canada.

The windage loss of small sized industrial coal is much greater than is generally realized. Tests have shown that in shipping ¼"x0 coal a distance of 500 miles, there may be losses amounting to from 2½ to 3 tons per car. An additional loss of 6 per cent was observed by one firm in storing such coal in open storage piles for a period of six months.

A careful check will show that windage loss is a considerable factor in coal costs. The continual dust nuisance may also be objectionable.

In making a check on windage loss, it is necessary to determine the change in amount of surface moisture in the coal from the time it is weighed out at the mine to the time it is weighed in at the mill. A certain amount of the windage loss, for example, is replaced by an increase in surface moisture and this determination would permit the amount to be calculated.

4. Disintegration of bituminous coals is eliminated.

Bituminous coals of high inherent moisture content disintegrate rapidly after mining through contact with air. When properly capped, this grade of coal may be stored for long periods.

The coal seal can be made of any one of a number of materials; such as cut-back asphalts, asphalt emulsions, road tars, waxes, etc. Some of the materials require preheating; some do not.

The selection of the material varies according to cost, location, equipment, objectives, etc. Generally, the material costs from seven to ten cents per gallon, and one gallon will cover from two to three square yards of surface. Because the cost of capping is determined by the surface area to be covered, the higher the coal pile, the less the cost per ton.

Pyramids of coal and ice resulting from purposely leaving unprotected spots in 20,000-ton storage pile. Indicates what happens to uncapped coal in winter.

In the capping of coal storage piles, the capping material is placed in a mobile storage tank. This tank is equipped with a heating device, a high pressure pump or a compressed air connection, and with a hose connection for attaching distributing hose.

The distributing hose is usually ½ inch in diameter and in lengths of 50 feet. At the discharge end of the hose is a spray bar equipped with nozzles to spray the capping material over the exposed surfaces of the coal.

To cap a pile, the operator starts at the top and retreats around it until the base is reached. Where bridges are over the coal, a long spray bar can be attached directly to the tank and the entire arrangement swung over the pile. Likewise, a spray bar extending over the width of a railroad car may be used for capping loaded cars of coal.

Jobs and Productivity

▶▶▶ BUSINESS CANNOT guarantee jobs because business makes products, not jobs. People are not employed just to be put on the payroll, but to produce something for sale—and jobs depend upon sales. No employer can guarantee a given number of jobs unless the market for his product matches his production schedules.

But the postwar problem is to create new markets or enlarge old ones to absorb from 35 to 50 per cent more goods and services than were produced or rendered in 1940. Whatever war savings, reduced taxation, increased public works and export trade might temporarily or permanently contribute, the necessary increase in markets must come chiefly from increased purchasing power. Since purchasing power is dependent upon the relationship of incomes and prices, the problem is to have prices sufficiently low and incomes sufficiently high for people to buy a great deal more than they ever did before the war.

The industrial work week which has averaged 45 hours—with pay for 47.5 during the war—will average around 38 hours and provide little or no overtime after the war. If wartime hourly wage rates prevail, the reduction in incomes will be 20 per cent. There will also be transfers from highly paid wartime jobs to lower paid peacetime jobs. As to prices, they have already moved up 30 per cent since 1940. This combination of reduced incomes and higher prices is exactly the opposite of what we need.

These observations have led a few industrial executives to adopt a rather gloomy view of the future, and to accept a philosophy of leaving things to take care of themselves until wages and prices reach their proper balance. Fortunately, this static attitude has been offset by recent announcements on policy by the National Association of Manufacturers and prominent industrial figures such as Mr. Charles E. Wilson of General Electric. They have endorsed what we might call a dynamic philosophy, expressed in broad terms by the National Association of Manufacturers, and in very specific terms by Mr. Wilson, who said it would be General Electric's postwar policy to sell at the 1940 price levels while paying wages, that is "take home" pay, at the 1944 levels.

From a talk by Albert Ramond before the Graduate Economic Club, Columbia University, December 13, 1944.

Current Outlook for Paperboard

W. IRVING OSBORNE, Jr., President
National Paperboard Association[1]

▶▶▶ PRESENT INDICATIONS are that paperboard production for the year 1944 was slightly in excess of 7,800,000 tons, which will prove to be just under the industry's peak year of 1941, which recorded the all-time high of 7,837,000 tons. This is certainly a very creditable showing for the industry in the light of the serious handicaps of well-known shortages of manpower, pulpwood, wood pulp, and wastepaper. Although some civilian needs suffered last year, military requirements were met.

It would be nice to say that with this fine performance behind us we are now in a position to reach new heights and have more board available for all consumers in the year 1945. Unfortunately, however, on the assumption that the present year will be a full year of war, and in consequence that we will all operate under a stricter military economy than in 1944, the outlook cannot be too optimistic, and it will only be with extreme good fortune and complete utilization of the industry's ingenuity that last year's tonnage can be equaled.

Production for the first seven weeks of this year is at about the average weekly level of last year, which is most encouraging in view of the severe weather conditions which have prevailed in both the northern and southern producing areas. The increasingly critical raw material and manpower shortages will likely be limiting factors in future operations.

The wood pulp supply has been well advertised as extremely short, and increased demands for munitions and lend-lease requirements will surely mean that all mills will have less pulp available to them for at least the second quarter.

During the first seven weeks of this year paperboard mills, members of the National Paperboard Association, reduced their inventories of wastepaper 12.4 per cent or a total of 20,070 tons. Therefore, further losses in wood pulp will be difficult to replace with wastepaper. In fact, current rates of board production can be maintained only by sharply higher accumulations of wastepaper. The Salvage Division of the War Production Board, the newspaper and magazine publishers of the country, the mills and many other organizations are cooperating to accelerate the saving and collection of wastepaper.

The extremely important kraft board division of the industry has been handicapped by shortages of woods labor, trucks, tires, and such necessities for the procurement of sufficient pulpwood to run their mills at full capacity. Recent production figures are, however, a splendid testimony as to the success they are having in overcoming these difficulties.

A very large majority of the industry's production has been moving into the channels of direct war uses and for the packaging of war supplies and those of essential civilian requirements.

At the present time the Army visualizes an immediate and constantly increasing demand for paperboard for manufacture of such items as shell containers, bomb bands, small arms ammunition boxes, and ration cartons. Indeed they contempate that requirements for most of these purposes will approach a 100 per cent increase between the first and fourth quarters of the year.

The paperboard shipping container picture is one of increasing difficulty. Although millions of V-type solid fibre and corrugated shipping containers are being manufactured each week, sharply stepped up demands for these V- boxes and other Army and Navy requirements are taking such additional tonnages of paperboard that the lower priority rated civilian goods are unable to meet their shipping requirements.

It is evident, therefore, that even though the industry's production of last year may be equaled, civilian supplies of paperboard are in substantially less supply than last year. This condition is not likely to change until the requirements of the military services are greatly reduced. Until that time, a serious civilian packaging condition can only be averted by the most thorough and intelligent co-operation of the Armed Forces, governmental control agencies, and the producers and consumers of paperboard and paperboard products.

(1) Mr. Osborne is president of Cornell Wood Products Company, Chicago.

Training Laymen for Technical Jobs

▶▶▶ THE SCIENTIFIC marvels of our new weapons are giving Americans a foretaste of the trend of postwar manufacture. Made to withstand the rigors of battle, but precise to a degree formerly found only in laboratory equipment, the tools of today's soldier some day will be translated into new automobiles, cameras, and home devices.

The returning soldier, his family, and the public at large are looking forward to a vastly improved way of life. Industry, from its smallest to its largest component, is planning to fill this demand and to draw from its library or wartime experience in building an even higher standard of living.

But the postwar period will require something more than demand and an ability to make the products to fulfill the public's desires. It will require a scientific distribution system—salesmen schooled in the intricacies of the products to be made and sold.

Today's weapons are used and controlled by troops trained in their use and are serviced and maintained by specialists. Tomorrow's products, built to intricate and exacting standards, will require a new type of sales and maintenance personnel to provide and maintain a market.

On the horizon is a new science ready to make a place for itself in the postwar market . . . electronics. Proved in the current conflict, doing a thousand jobs quicker and more accurately than ever before possible, and with a vast influx of new companies in the field, electronics has staked a claim stretching from postwar aircraft to garage doors. By advertising, by news stories from the war theaters, and by word of mouth, the public has learned of the potentialities of the science and is looking forward to the day when the electron will help to make a happier, safer, and more convenient life.

(Excerpted from article by Charles B. Sweatt, published in *Executives Service Bulletin*, Policyholders Service Bureau, Metropolitan Life Insurance Company.)

Paper SKETCHES. . . . . .

IN THE YEAR 1768, PHILADELPHIA EXPORTED 1877 REAMS OF PAPER TO THE OTHER AMERICAN COLONIES.
IN 1870, THERE WERE 33 FACTORIES IN THE U.S. DEVOTED EXCLUSIVELY TO MAKING PAPER COLLARS.
MULTI-WALLED PAPER BAGS WITH A SPECIALLY CONSTRUCTED INSIDE PLY ARE BEING USED FOR THE PACKAGING OF ROSIN IN 100-POUND LOTS. THE ROSIN ENTERS A BAG AT A TEMPERATURE OF ABOUT 300 DEGREES FAHRENHEIT AND REQUIRES ABOUT 24 HOURS TO SOLIDIFY.
Burkle
EARLY PRINTERS IMITATED THE MANUSCRIPT BOOKS OF THE PERIOD BY PRINTING UPON PARCHMENT, LATER USING PAPER TREATED TO LOOK LIKE VELLUM.

Industry Studies
Wartime Problems

▶▶▶ THREE DAYS OF intensive study of industry problems by outstanding leaders in the paper industry marked the successful effort of the American Paper and Pulp Association to substitute official meetings of the Association and its committees and divisional association meetings for the usual annual convention.

Although the attendance strictly limited to those having a definite part in the deliberations, it was the consensus of opinion that never before has so much constructive work been done as in the three days beginning Feb. 19.

As there were no addresses of a formal nature, no resolutions promulgated, it is difficult to outline the series of meetings in the usual form of a summary of convention action.

It is possible, however, to describe the week as one in which every phase of the industry's problems for the coming year was studied and evaluated, and one in which every effort was made to find means of most satisfactorily meeting the difficult situations which are certain to arise. In this effort the paper mill executives were able to have the co-operation of representatives of various governmental agencies who by their analysis of probable future developments were able to afford a foundation for industry's future thinking.

One fact stood out in all the deliberations—the year 1945 will be a critical one for the industry because of the increasing demands for paper and pulp for military purposes on the one hand and increasing costs and tightening menpower conditions on the other.

The various Association committees devoted their entire attention to seeking means for meeting the crucial problems of the year, beginning with the basic raw material and leading up through the distribution of finished papers to relations of the industry to higher governmental officials and to consideration now of economic problems to come with peace.

Through discussions in such committees as the War Industry Committee, and the committees with special functions such as pulpwood, forestry and waste paper, the industry leaders sought means for alleviating the primary problem of the mills, the finding of sufficient fibrous materials to allow the mills to produce paper to the degree demanded for the military and for essential civilian uses. The pulpwood problem was found to be serious; principally because of the tighter manpower situation. The various committees considering the fibrous raw materials problem decided to use every effort to encourage maximum salvage of waste paper, its proper distribution to the mills in need of special qualities of such waste, and to foster the campaigns to get out more pulpwood. This can be accomplished in part by the allocation of more prisoners of war to woods work, and to intensification of the efforts to get out larger quantities of farm pulpwood. Prosperity in the areas where such wood has been most largely cut has tended to draw wood cutters from the forestry operations to other fields of work, and many farmers have not felt the need for adding to their income from

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Pioneer manufacturers of mobile materials handling machines . . . Fork Lift Trucks, Crane Trucks and Straddle Trucks. All pneumatic tire mounted. All gasoline powered.

this off-season work. Every effort will be made by all industry agencies to correct all of the conditions which are depleting the supply of raw material.

Discussions with War Production Board officials brought much general information to the manufacturers as to the conditions which they will have to face the coming year. It was evident from all of the statements made by such officials that the paper supply in 1945 will be curtailed, at least as far as civilian usage is concerned, from the amount available in 1944. No specific indication will be given of the extent of curtailment, if any, when pulp allocations are announced for the second quarter, and this will not be until after Governmental agencies have to decide on the program.

The entire tenor of forecasts in this field was that military requirements will increase, that total supply will be somewhat reduced, and that ordinary civilian supply may be sharply reduced. Contributing to this situation is the fact that there is an increasing demand for paper for overseas, and all such shipments will have to be taken from present quotas. Demands have also been filed for pulp for use of paper mills in liberated countries, but industry leaders are anxious to have foreign needs met by shipments of paper rather than pulp, which would be taken from domestic mills. Of the available pulp, an increasing quantity is steadily being called for from the munitions industry, consumption of ammunition having exceeded all early estimates.

Committees which are formed to maintain contact with Government bureaus discussed the future course of such relations, and the entire trend of sentiment was to continue the relationships which have so far been productive of fine results in bringing out paper for military uses, with a minimum of conflict with federal agents who at the outset did not see eye to eye with the paper manufacturers.

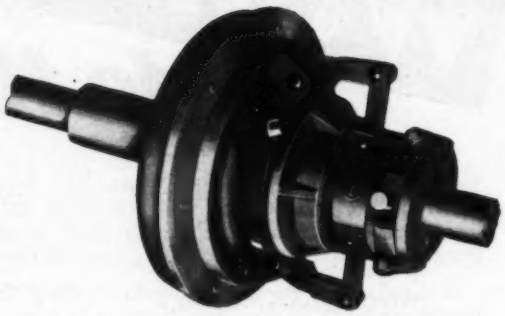
The future of the industry in the balance of the war and the days immediately following peace was broadly outlined by D. K. Brown, president of the Association, when he said that the need for good association team work is going to be greater than ever before. Problems, he said, will be many, not only those ordinarily pertinent to the operation of an industry, but also many of international importance, such as the tariff structure and international agreements affective world trade.

"We will need," he said, "all the advice and counsel that our industry can give us if we are to protect our high wages and standard of living in competition with the products of countries with lower standards. This is a vital problem of labor and management alike?

Mr. Brown cautioned the industry against an overexpansion which might come because of a feeling that the present shortage of paper indicates a lack of capacity. He said that despite reports of future great demands for paper the industry should guard against expansion without full investigation as to the assurance of a sufficient continuing wood supply to permit increased paper output.

All of the meetings and conferences of the week indicated an industry realization of Mr. Brown's statement that "More and more it becomes apparent that if private enterprise and its initiative are to survive, it must act with intelligence." Every committee meeting and every meeting of the divisional associations indicated a full appreciation of the need for constructive thinking for the future, rather than a search for immediate profit-making activities.

JONES-LEMLEY FRICTION CLUTCHES



JONES-LEMLEY friction clutches are built for a broad range of shaft sizes and ratings in both enclosed and open types for sleeve and coupling work. In addition they are available in a line of Jones-Lemley friction clutch pulleys. This clutch modification is also used for gears, V-belt sheaves, sprocket wheels, etc. Sizes, ratings, dimensions, prices and other data are contained in Bulletin No. 60. Your request will bring a copy.

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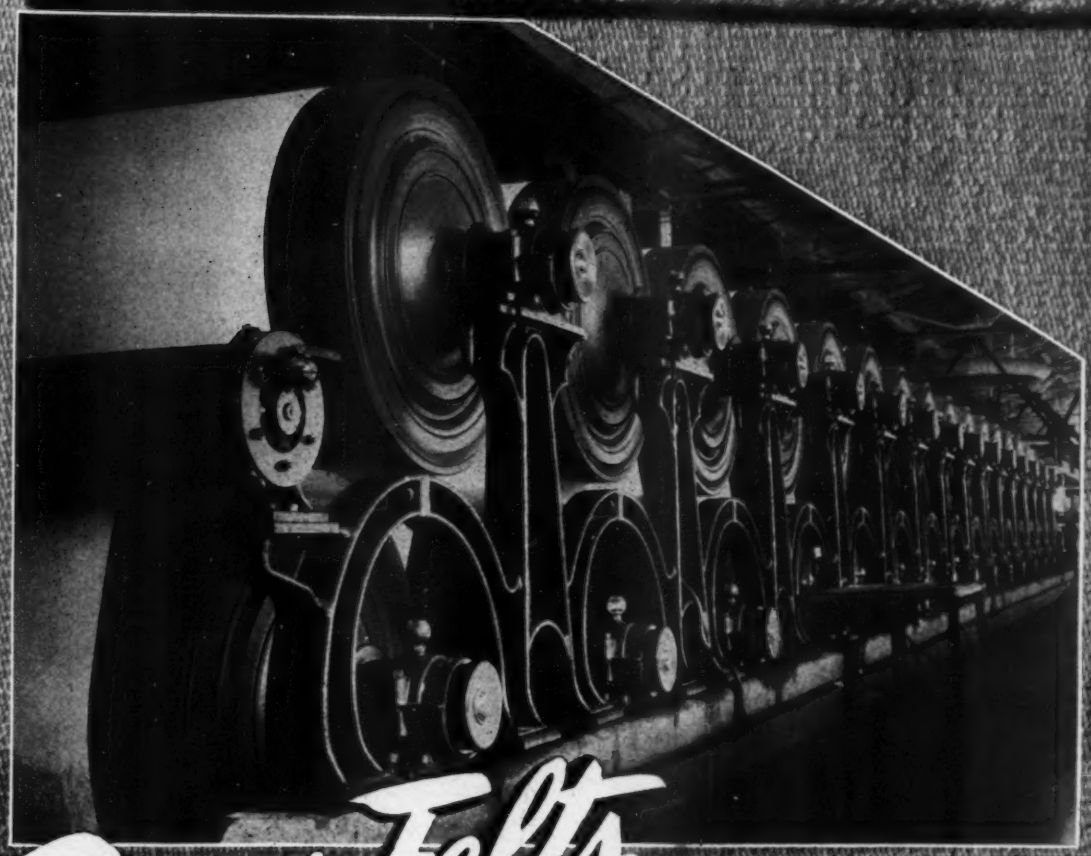
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES • ANTI-FRICTION
PILLOW BLOCKS • FRICTION CLUTCHES • TRANSMISSION APPLIANCES



Dryer Felts

"Engineered" to Each Mill's Requirements

With experience in the manufacture of dryer clothing, dating back to the beginning of the modern paper dryer, HOOPERWOOD "Canvas Engineering" has produced not one but several distinct types of Cotton and Asbestos Felts.

This policy has been of real assistance to Paper Mill Superintendents, in suiting the particular requirements of their mill—even down to each machine position, if desired.

Therefore, if it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an Asbestos Felt to withstand the advanced temperatures involved in high-speed production of Kraft and other heavy papers—HOOPERWOOD "Canvas Engineering" has the answer to your problem.

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Mills: WOODBERRY, BALTIMORE, MD.

HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS

APPA Three-Day Conclave

Replaces Annual Meeting

▶▶▶ ALTHOUGH THE ANNUAL convention of the American Paper and Pulp Association this year was cancelled, due to war circumstances, there were some representatives of paper and pulp mills from various sections of the country in New York during the week of February 19, and executive committees and governing boards of many of the groups affiliated with the Association held meetings at the Waldorf-Astoria Hotel.

Daniel K. Brown, president of the Neenah Paper Company, Neenah, Wis., was re-elected president of the American Paper and Pulp Association for the ensuing year at a meeting of the Association's Board of Governors on February 21st at the Waldorf-Astoria.

Cola G. Parker, of the Kimberly-Clark Corporation, Neenah, Wis., was re-eltected first vice president, and E. W. Tinker was again elected executive secretary and treasurer.

The following vice presidents, also constituting the Executive Committee, were elected for 1945:

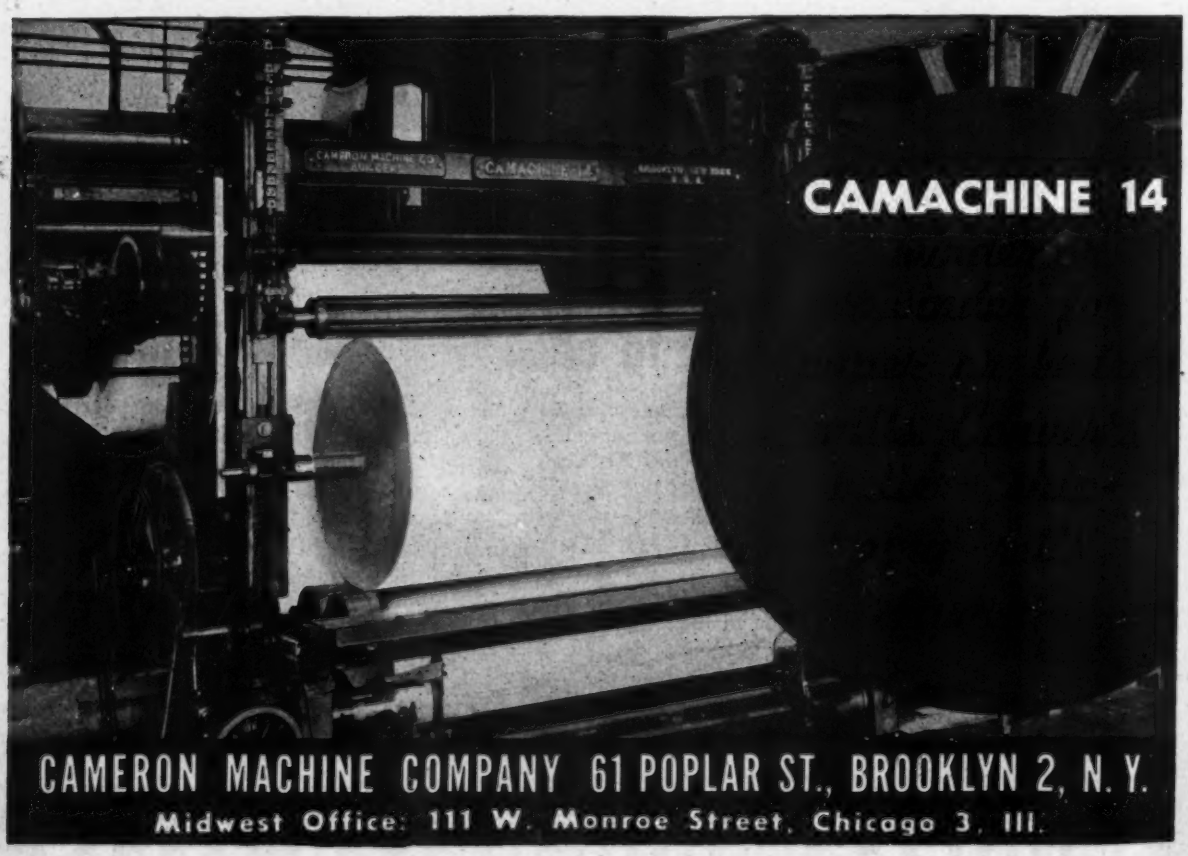
Hugh J. Chisholm, Oxford Paper Company, New York City; R. K. Ferguson, St. Regis Paper Company, New York City; P. H. Glatfelter, P. H. Glatfelter Company, Spring Grove, Pa.; J. H. Hinman, International Paper Company, New York City; D. S. Leslie, Hammermill Paper Company, Erie, Pa.; David L. Luke, Jr., West Virginia pulp and Paper Company, New York City; R. A. McDonald, Crown Zellerbach Corporation, San Francisco, Calif.; J. L. Madden, Hollingsworth & Whitney Company, Boston, Mass.; Dwight L. Stocker, Michigan Paper Company of Plainwell, Plainwell, Mich.; George R. Wallace, Fitchburg Paper Company, Fitchburg, Mass.; R. B. Wolf, Pulp Division, Weyerhaeuser Timber Company, Longview, Wash., and J. D. Zink, Strathmore Paper Company West Springfield, Mass.

Report to the Industry

The Association's president, D. K. Brown, made the following annual report at the meeting of the Executive Committee and Board of Governors at The Waldorf-Astoria Hotel on February 21:

▶▶▶ IN VIEW OF the many problems that have confronted the industry during the past year and in view of the fact that there will be no opportunity to report in person, it is perhaps in order to present by letter some of my reactions to the efforts made by the American Paper and Pulp Association and the supporting Divisional Associations in the industry's behalf.

More and more it becomes apparent that if private enterprise and initiative is to survive, it must act with intelligence; and this means that it must be kept constantly informed regarding industry's broad economic and social problems.



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The foregoing may offer a clue to the solution of some special problem of yours. If so, we shall be glad to hear from you with details, which will be treated in strict confidence.

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- Machine shop . . . specially equipped for finishing stainless steel.
- Improved cleaning . . . including Lustracast electrolytic finishing which leaves all surfaces bright.
- Castings furnished rough, polished or fully machined . . . one ounce to two tons.
- Development of special alloys to meet unusual requirements.
- Technical consulting service.
- Zyglo detection of surface imperfections.

THE Cooper ALLOY FOUNDRY CO.
STAINLESS • MONEL • NICKEL

As I review the work of the American Paper and Pulp Association during the past twelve months, taking into account the many ramifications and divisions within our industry, I feel justified in stating that while we cannot claim perfection, yet by and large the industry has expressed itself effectively and in most cases has taken intelligent action on problems affecting the industry as a whole.

Having had the privilege of attending meetings of various committees throughout the year, I have been greatly impressed with the conscientious service being rendered by committee members. The contribution of these committees to the welfare of our industry is probably not sufficiently well known nor fully appreciated.

No amount of money could employ the ability and knowledge that has been available to the industry as a result of this voluntary cooperative effort and I want to take this opportunity of expressing thanks for the encouragement and help received through the willing service on these committees of executives from large and small organizations alike. Thanks are also due to the various Divisions and the Secretaries thereof who have not only done a magnificent job in keeping their members advised of all developments, but have also given splendid co-operation to the parent Association.

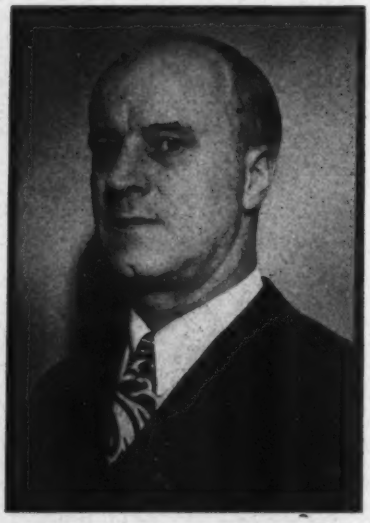
It is my firm conviction that after the war is won the need for good association team work is going to be greater than ever before and that the stronger we can make our united effort the better will we be able to meet and solve the difficulties that will then confront us.

The problems will be many, not only those ordinarily pertinent to the operation of an industry, but also many of international importance, such as the tariff structure and international agreements affecting world trade. We can no longer live unto ourselves, and ways and means will have to be found to accept and absorb some portion of the world's goods in payment for our own export commodities.

We will need all the advice and counsel that our industry can give us if we are to protect our high wages and standard of living in competition with the products of countries with lower standards. This is a vital problem of labor and management alike. It is probable that Government controls over imports and exports will be continued for some time and these controls may be extended unless industry itself takes steps to organize for the tasks considered in the national interest, such as contributing to the balancing of our international account, full employment, etc. Despite this we must do everything possible to keep our industry in a position to enable it to negotiate on equal terms with foreign competitors.

Our industry can be proud of its contribution to the war effort, no small part of which is due to those members who have given and are giving so unselfishly of their time and effort to the various government agencies. To them we owe a great debt of gratitude as well as to those organizations that have so generously released key men for long periods of time.

Without their help and the splendid leadership in the Forest Products Bureau, which has inspired the utmost co-operation and efficiency in the Pulp and Paper Division, our problems would have been much more difficult during recent years.



D. K. Brown, re-elected president of the American Paper and Pulp Ass'n

By reason of the critical situation which has developed and still prevails in our industry, we have received tremendous free publicity from the press, magazines, and radio, which has created a public consciousness and appreciation of the value and importance of our products, both to the war effort and to peacetime economy.

We must find means to capitalize on this publicity in the future and thus continue to develop and maintain the position of our industry in the national life that it so well deserves. A start in this direction has been made by the employment of a public relations counsel on the Association's staff; through him we hope to channel to the public all information of an over-all industry nature.

As to the present outlook and immediate future of our industry, I can add nothing to what you already know. Suffice to say that it is going to tax our research, ingenuity, and practical application if we are to come close to meeting the demands immediately confronting us. However, I am confident that whatever emergencies may develop will be met in the same broadminded spirit that has existed to date in both integrated and converter mills alike.

In this connection, I want to pay my personal respects for the broad acceptance by the integrated mills of the policy which resulted in the diversion of pulp to the converter mills. This policy has had a far reaching effect in stabilizing employment in many localities where the community dependency on our industry is very high.

Reports have recently been published by certain agencies regarding the probable demands for our products in the years immediately following the end of the war, which statements might be construed by financial institutions and the investing public as warranting large expansion of our industry. It is not my intention to contradict these statements except to caution the industry against overexpansion without full investigation as to the assurance of a continuing wood supply therefor, as it is conceivable that legislation and other regulations on cutting of forest lands may result in setting a limit thereon at an amount which could be consumed by presently existing equipment.

Due to growth of population and the pent-up demand for our own civilian requirements as well as new uses for our products, it quite possibly justifies a reasonable extension of our facilities; but it would be a calamity if we were to overexpand to meet conditions which may not be of long duration.

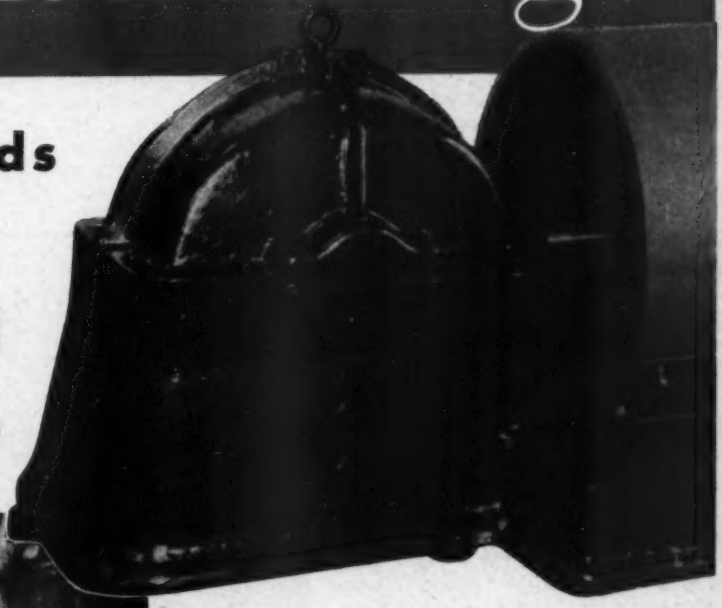
In closing, I want to pay special tribute to the members of the Executive Committee and Board of Governors for their splendid support during the past year, as well as to our efficient Executive Secretary and his staff for their loyal support.

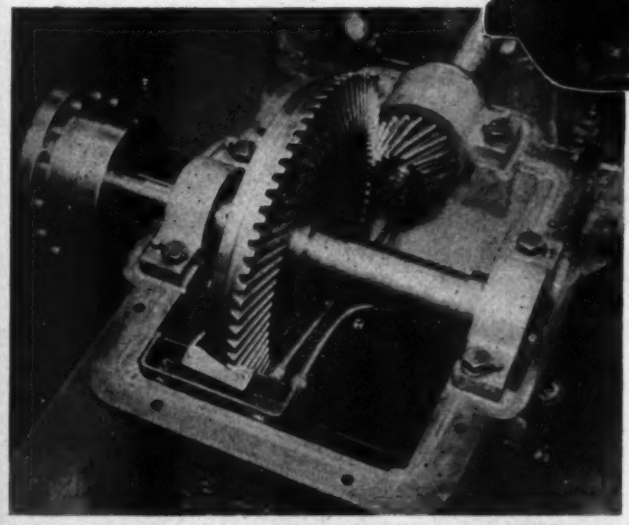
E. W. Tinker Warns That Industry May Face More Disturbances in 1945

Each year E. W. Tinker, executive secretary and treasurer of the American Paper and Pulp Association, issues a statement concurrent with the annual APPA convention. His regular report, which follows, was released during the three-day gathering of industry officials in New York:

Timken Bearings

carry the loads in this BLACK-CLAWSON Paper Mill Drive





TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

Bearings were no problem to the Black-Clawson Company when designing this spiral bevel gear drive; they laid in Timken Tapered Roller Bearings. Based on years of experience with them, they knew they could depend on Timken Bearings to do the job efficiently, dependably, economically.

The bevel gear shaft is mounted on single Timken Bearings, while a double NA Type Timken Bearing is used on the pinion; thus full provision is made for all loads—radial, thrust, or both together in any combination. Friction and wear, of course, are reduced to the point of elimination.

When buying equipment of any kind ask this question: "Is it Timken Bearing Equipped?" Make sure the trade-mark "TIMKEN" appears on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio.

▶▶▶ RECENT TRENDS indicate that the relative stability that characterized pulp and paper production during most of 1944 may be short-lived and that serious economic disturbances may be in store for the paper industry and its customers in 1945. Unless steps can be taken to correct the factors that are threatening production, it is probable that the delicate supply and demand balance that has been maintained, largely by government control measures, will be seriously upset. The alternatives are clear. Either the production obstacles must be overcome or else new and more drastic paper consumption controls must be expected.

The current outlook is somewhat analogous to the situation that confronted the industry one year ago. The crux of the problem is now, as it was then, fiber supply. By a hard-driving co-ordinated attack, in which agencies, both public and private participated, the obstacles impeding paper production in 1944 were successfully overcome. Unfortunately, recent developments necessitate the marshalling of forces for a new and perhaps even more vigorous campaign in 1945.

The first and major obstacle to an adequate paper supply is pulpwood. Pulpwood production in December 1944 was 10.4 per cent below production for the corresponding month of 1943. While statistical confirmation is not yet available the decline in pulpwood receipts since December has been marked and the situation is progressively deteriorating.

If essential paper requirements are to be met this deterioration must be stopped and the present trend in pulpwood receipts reversed. It was stated as a guide to action in the current pulpwood emergency the American Paper and Pulp Association proposes the following specific measures:

(1) Congress and the Selective Service Bureau in the consideration of deferment policies should recognize the importance of farm labor to pulpwood production. Farm labor normally accounts for approximately 40 per cent of the domestic pulpwood supply. Abrogation of the protection afforded farm labor by the Tyding's amendment or the tightening of Selective Service policies with respect to draft deferments for farm labor in pulpwood areas could have very drastic effects on the future pulpwood supply.

(2) The War Manpower Commission should lend assistance to the industry in the matter of labor referrals. The War Production Board has sent a Field Service Bulletin to War Production Board Regional Directors, Production Urgency Committee Chairmen and District Managers requesting that they give every possible consideration in granting sufficiently high urgency ratings to insure adequate manpower referrals to producers of logs, lumber and pulpwood. More recently these activities have been declared "critical" by War Mobilization Director Byrnes. The War Manpower Commission should follow through.

(3) The War Department should make available, as rapidly as possible, as many prisoners-of-war as the industry can absorb. The industry, government agencies and the labor

E. W. Tinker, executive secretary APPA

unions should support policies that will result in maximum utilization of prisoners-of-war in the woods.

(4) The War Production Board should continue its policy of making available necessary equipment for wood procurement purposes. The Office of Price Administration and the Office of Defense Transportation should liberalize their policies with respect to allotments of trucks, tires and freight car facilities.

(5) Congress should enact legislation extending the Timber Production War Project, and the informational and educational work of the T.P.W.P. should be pursued with renewed vigor.

(6) Pulpwood producers should abandon any unduly restrictive specifications that might interfere with maximum pulpwood procurement.

(7) Producers should adopt mechanized methods for pulpwood procurement to the maximum possible degree.

(8) Pulpwood producers should made every effort to co-ordinate the activities of their individual contractors, rendering aid and advice wherever practical.

(9) Industry support of the War Activities Committee of the Pulpwood Consuming Industries should be continued.

The problem of pulpwood supply can never be solved by over-optimism. If the industry is to fulfill its war obligations, its work program must be effectively co-ordinated in order that an adequate supply of pulpwood may be made available for pulp and paper production.

If the trend established in December, 1944, persists, it is estimated that a total of 16,000 additional workers would be needed to meet the domestic goal of 16,000,000 cords of pulpwood in 1945 and at the same time restore inventories to the level of December 1942, it was stated. Estimates of regional requirements are presented herewith:

Region	Pulpwood Shortage (cords)	Additional Men Needed
Northeastern	1,051,000	5,255
Appalachian	371,000	1,855
Southern	1,299,000	6,495
Lake	237,000	1,185
Pacific	252,000	1,260
Total	3,210,000	16,050

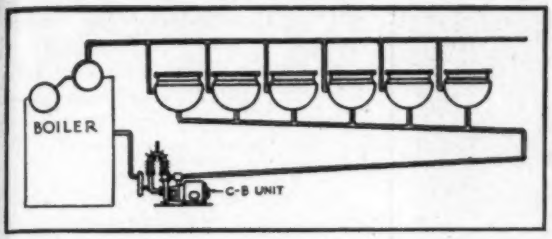
The second major obstacle to an adequate paper supply is *waste paper*. Waste paper inventories held by paper mills have been declining steadily since September, 1944. Inventories of reporting mills on January 1st were 25.7 per cent below the September level, and the supply situation has been deteriorating steadily since December.

A year ago, when the outlook for waste paper supply was comparably dark, a carefully co-ordinated drive for salvage was undertaken. While the total receipts in 1944 were far short of the War Production Board goal of 8,000,000 tons, the results of the drive were nevertheless noteworthy. A total of 6,928,000 tons was collected, representing an increase of 12.5 per cent over receipts for the preceding calendar year. In 1944, wastepaper represented 37 per cent of the industry's total available fiber tonnage, as contrasted with 35 per cent in 1943.

Shortages of pulpwood and wood pulp will certainly result in an increased demand for paper stock in 1945. An adequate paper supply will, in large measure, be contingent upon the satisfaction of this demand.

To aid in the satisfaction of this essential raw material demand, the following specific recommendations are offered by the Association:

(1) The industry should continue to support those industry committees



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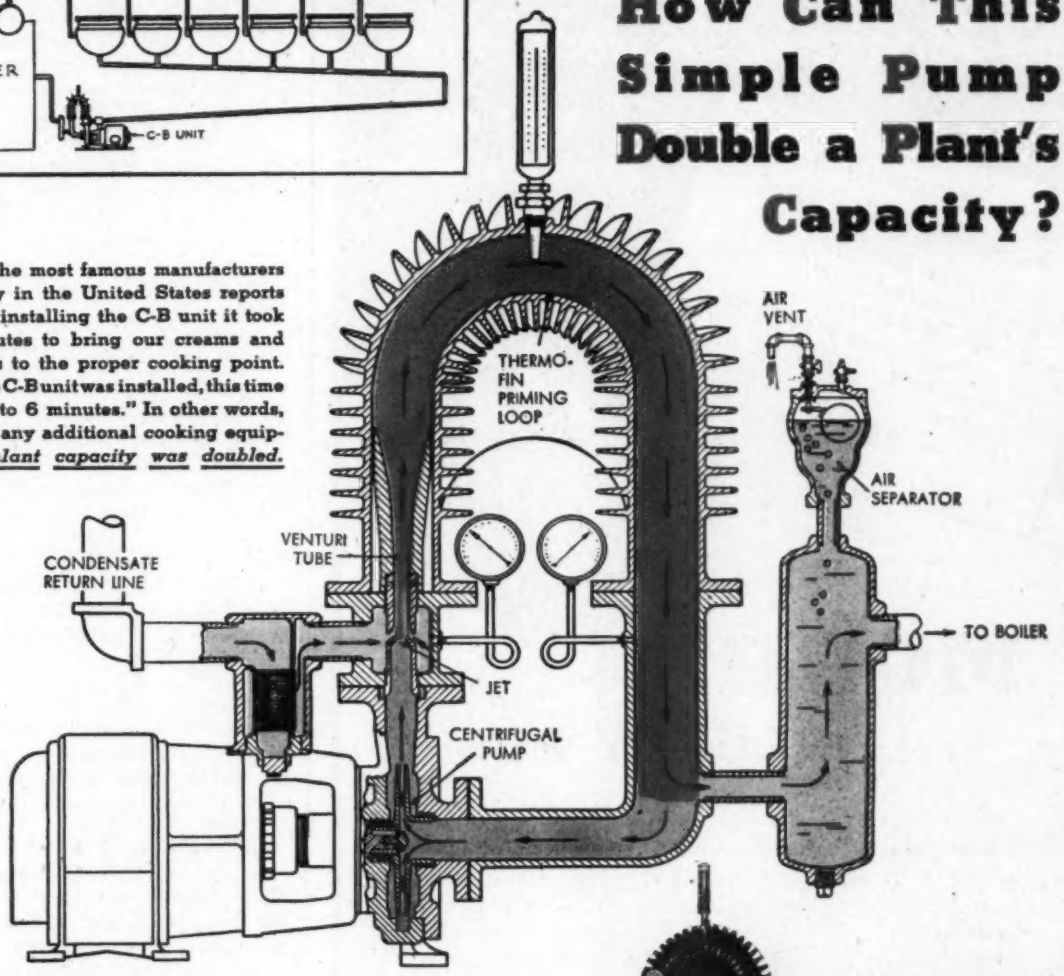
One of the most famous manufacturers of candy in the United States reports "Before installing the C-B unit it took 12 minutes to bring our creams and caramels to the proper cooking point. After the C-B unit was installed, this time was cut to 6 minutes." In other words, without any additional cooking equipment, *plant capacity was doubled.*



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The most remarkable results in the field of process cooking, drying, heating, etc. are being obtained by this new method of utilizing or saving the heat units contained in the condensate draining from the process equipment, and returning every Btu possible back to the boiler. The C-B System, a "closed" system, based on the aspirator or injector principle, has been proven in over 400 installations in the past 7 years. Results are almost unbelievable.

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FEATURING
the desirable combination of
1. Uniform delivery
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Used exclusively for handling black liquors, Morris Slurry Pumps consistently outlast and outperform lighter pumps in pulp mills all over the country. Designed for uniform delivery of highly viscous liquors at high temperatures, they maintain their efficiency over consistently longer periods . . . with marked freedom from clogging, corrosion and packing difficulties.

Built to Last

Morris Slurry Pumps have more metal where metal counts most. Designed for moderate speeds, they keep vibration and abrasive wear at a low point. The pumps are capable of operating against high heads caused by high pipe friction losses and often high terminal pressure. The parts in contact with the liquor are furnished either in nickel iron, Ni-resist or stainless steel, depending upon the abrasive or corrosive properties of the liquor.

Write for special "Slurry Pump" bulletin. Find out how Morris Pumps will give you longer life and more satisfactory service per pumping dollar.

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that have been organized to further the cause of wastepaper salvage.

(2) The salvage effort of the A.N.P.A., N.P.A., the commercial printers, and other paper consuming industries should be continued with increased vigor.

(3) The export of paper stock through F.E.A. should be discontinued in the present emergency.

(4) Fine papers should be separated from coarse papers in salvage drives, and the principle of "highest economic use" of salvaged stock should be adhered to.

(5) Industry representatives should actively co-operate with local salvage committees in the areas in which they are located without regard to their direct interest in the salvaged stock.

(6) The Salvage Division of the War Production Board should be maintained and should be adequately staffed both in Washington and in the field for effective paper salvage work.

Another factor threatening 1945 paper production is the wood pulp situation. Wood pulp inventories have declined 17.1 per cent in the course of the past year and pulp allocations for the first quarter are on the basis of a five-day average supply. With such a narrow margin of fibre supply, intermittent shutdowns are bound to occur with a consequent loss of paper production.

It is to be hoped that this situation will not be further aggravated by the ill-considered export of vital raw material supplies under an F.E.A. program at a time when our domestic paper production program is already in jeopardy.

By an all-out production effort and by the depletion of fiber inventories, paper production in 1944 was successfully maintained. In the light of recent trends and developments, however, it must be reported that the outlook for 1945 is currently far from good. It is clear that an aggressive well co-ordinated effort will be necessary if the country's rapidly increasing pulp and paper demands are to be met, the statement concluded.

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▶▶▶ THE FIRST ISSUE of *Corn*, a publication introduced by Corn Industries Research Foundation, came out last month. In its opening editorial the statement is made that "we trust it will yield at least 50 bushels of corn facts and fancies per acre of paper." Some very interesting facts and data are given in this first issue, and considering the importance of agriculture and the expanding research for new products therefrom, this new publication enters a broad field.

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TAPPI Elects Officers and Awards Medal

▶▶▶ HAVING CANCELLED its annual convention following the request of War Mobilization Director Byrnes, the only activity of the Technical Association of the Pulp and Paper Industry during Paper Week in New York was a luncheon meeting sponsored by the Executive Committee on February 19 at the Hotel Commodore, attended by approximately 100 members.

The election, largely by mail ballot, resulted in the re-election of Vance P. Edwardes, of the International Paper Company, as president of the Association, while Gunnar W. E. Nicholson, of the Union Bag & Paper Corporation, was re-elected vice president. Elected to the Executive Committee for three-year terms were Worthen E. Brawn, of the Pejepscot Paper Company; William R. Barber, of the Crown Zellerbach Corporation; John A. Hanson, of the Badger Paper Mills, Inc., and James E. Wise, of the Kalamazoo Paper Company. R. G. Macdonald continues as secretary-treasurer.

Papers which were to have been presented before the cancelled thirtieth annual convention of TAPPI will be considered as having been read by title. They will be printed and copies sent to the membership.

Tappi Medal Presented to B. W. Scribner

The feature of the luncheon meeting was the presentation of the TAPPI Medal to B. W. Scribner, the presentation, on behalf of the Association, being made by Major James d'A. Clark. In accepting the prized award, Mr. Scribner stressed that Army and Navy procurement of paper supplies of satisfactory quality would have been seriously delayed had TAPPI testing methods not been in existence.

In making the medal presentation, Major Clark said:

"The by-laws of the Technical Association of the Pulp and Paper Industry authorize the presentation of an award to one whose achievements have definitely contributed to the technical progress of the pulp, paper and paperboard industry. Today I am privileged, as one who has worked very closely with the recipient for many years, to make the presentation of the medal on behalf of the Association.

"B. W. Scribner, who is a native of Pennsylvania, graduated in chemistry at the Pennsylvania State College. He was inducted into the art and mystery of pulp and paper manufacture at that excellent firm, the West Virginia Pulp and Paper Company, where he remained for over a dozen years directing the testing and control of raw materials and the finished products, and also doing research work on pulp and papermaking.

"After some time at the National Bureau of Standards, Mr. Scribner became Chief of the Paper Section of the Bureau in 1925, following F. C. Clark. Since that time, with the very able assistance of Dr. F. C. Carsons, C. G. Weber, and others, a number of very successful and fruitful investigations dealing with papermaking and testing problems have been carried out; notably on offset printing, litho papers, the preservation of records, currency paper, and on many problems involving the development of paper testing procedures and instruments. He is the author and joint author of a large number of technical papers as well as the chapter on physical tests of paper in Volume V of *The Manufacture of Pulp and Paper*, and the revised edition of *Paper Testing Methods*, published by TAPPI in 1928, a forerunner of the present loose-leaf volume of TAPPI Standards.

Vance P. Edwardes, re-elected as president of TAPPI

"For many years, Mr. Scribner has been very active in the development of Federal Specifications for papers and paper products as chairman of that committee; also, he has made contributions as a member of the committee on Government Printing Office Specifications. With his influence and association with government specifications for paper and paper products, he has done much to enhance and publicize the value of the standardization work carried out by TAPPI and secure the official recognition of this work in many government specifications and publications.

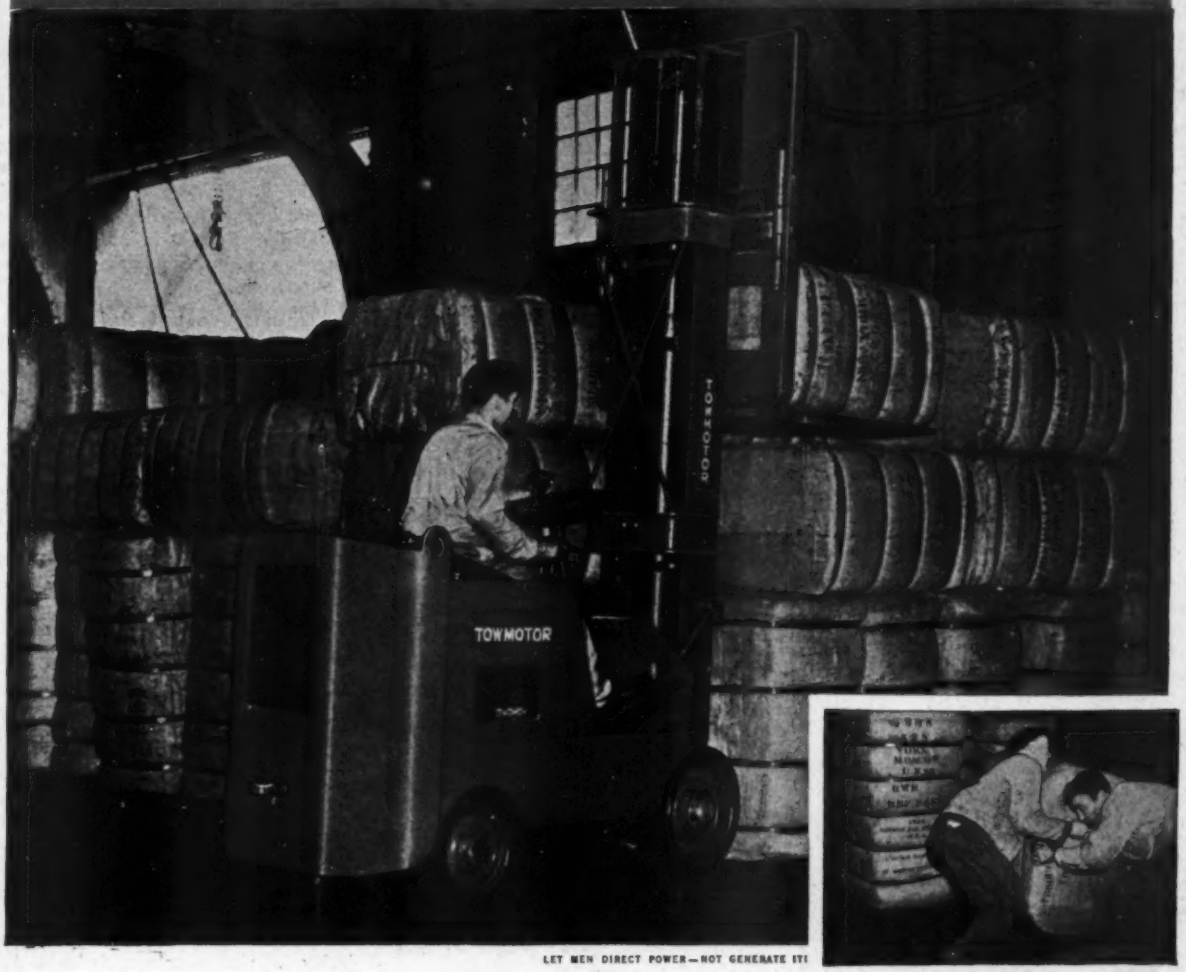
"In 1925, twenty years ago, he became chairman of the Paper Testing Committee of TAPPI and has enormously furthered the pioneering and development work of new test methods. He has devoted much of his time, and his spare time too, to the difficult job of securing the co-ordination of the efforts of a large and able TAPPI committee, composed of members having widely divergent views, with very successful results. The work of this committee has been much more effective in bringing about an increase in quality and other developments in the manufacture of paper than is generally realized.

"No consistent and sustained progress can be made in any technical endeavor unless the results can be measured and expressed numerically. The more accurately one can measure the results, the easier it is to connect slight deviations or improvement in quality with slight changes in the manufacturing procedure. Once a correlation between cause and effect has thus been established, the way to an improvement becomes obvious. There can be no papermaker here today, who has not sometime in the last two decades been able to effect some improvement in some quality or the uniformity of his product by the process just described. Thus were it not for the development and standardization of testing procedures for the qualities of paper, except by accident, technical progress in the pulp and paper industry towards improving the quality of their products would be utterly impossible. In that respect, we would be back to the good old days when what was good enough for grandpa is good enough for me.

No additional stress need be laid on the very great and obvious boon that the existence of standard test

HANDLING+Processing+HANDLING+Assembling+HANDLING+Packing+HANDLING+Storage+HANDLING

HANDLING—the Common Denominator of PRODUCTION



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Planned production depends largely for its success on efficient materials *handling.* A handling operation starts each job, moves it along through processing and assembly to storage or shipment. Every other link in the chain of performance can rightfully be labeled "Handling."

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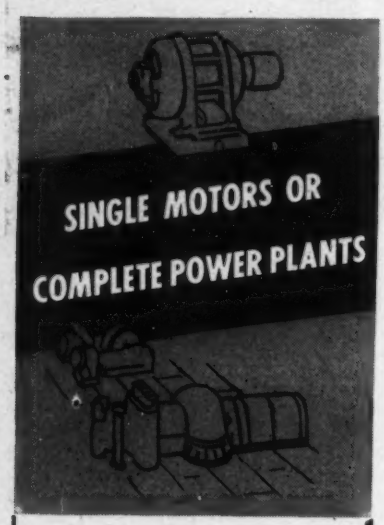
methods has been to Army and Navy personnel in preparing specifications for military use. It is no accident that the American technique of military packaging and packing is, in proportion, about as far ahead of that of any other nation as is the prevalence of nationally recognized standard methods of testing. I may add that the existence of a few internationally agreed standards of testing has been of immeasurable help in correlating our efforts with those of our Allies, and the more we can do towards international standardization in the future, the better off everyone will be, not only in war, but also in peace.

A minor achievement of Mr. Scribner's which also should be recorded, is his successful handling of the chairmanship of the Testing Division. You will remember that a couple of years ago, during the medal presentation to Harry Fletcher, Bob Wolf recalled the Scot who said, "I am willin' tae be convinced, but I ha' yet taw see the mon wha' could dae it." Well here is a man who at least has done and can do it occasionally.

Mr. Scribner, it gives me much pleasure to present the TAPPI gold medal to you on behalf of the Technical Association of the Pulp and Paper Industry."



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Mr. Scribner's Response

"I wish to thank the members of the Executive Committee for the award of the TAPPI medal to me and to express my very deep appreciation of the honor. I appreciate it not only as a personal tribute but as a tribute as well to my colleagues at the National Bureau of Standards and members of the Technical Association of the Pulp and Paper Industry who have been associated with me in the development of technical knowledge relating to paper and papermaking.

"The National Bureau of Standards has been closely associated with TAPPI from the time the Association was organized in 1915, as the Bureau recognized the identity of the aims of the two organizations in promoting standards for paper and furthering technical knowledge in general in the paper industry. The excellent co-operation the Bureau has always received from TAPPI, both as an organization and from individual members, has been most helpful in both research problems and standardization activities, and I wish to take this public opportunity to express my appreciation of it.

"The important, long-range researches in the paper section of the Bureau are planned and carried out with the advice of representatives of outside organizations particularly interested. Much of the research has had the co-operation of committees composed in whole or in part of TAPPI members. This has assisted materially in the development of the Bureau literature on paper and related subjects comprising now nearly 200 articles dealing with papermaking materials and processes, properties and testing of paper, use of paper in printing, permanence and preservation of paper and records, and standards of quality for papers, paper products and related materials. A large amount of information developed by research and testing in the paper section is not of a nature to warrant publication in news releases. Information of this kind articles but much of it is published in results from such work as development of papers required by the Government for special purposes, and short investigations made to supply answers to inquiries received. We are fortunate in having capable key men of long experience in the work of the paper section, whose names are well known to you—M. B. Shaw for his studies on papermaking problems, C. G. Weber for his work on quality and performance standards, and F. T. Carson for his development of paper testing standards.

"I wish to congratulate the Association on the hearty support it has given to the development of standards and its achievements in this respect. Naturally, being a member of an organization that has standards as its chief business, I believe that this is the most valuable contribution to paper technology that has been made by TAPPI, and it has been made possible only by the unselfish devotion to it of TAPPI technicians and the heads of their organizations. Much of the research and testing required for the development of the standards is done in commercial laboratories. R. C. Griffin's work in this field, as chairman of your Standards Committee is outstanding.

"When I accepted the Chairmanship of the TAPPI Paper Testing Committee in 1925, it was with the provision that paper testing methods would be written up in standard form and that the Association would set up machinery for making them official Association methods. This plan had been previously recommended by F. C. Clark in his 1922 annual report of the Paper Testing Committee. My proposal was accepted by the president, George Spence, the secretary, W. G. MacNaughton, and the Executive Committee. Under the chairmanship, successively, of F. C. Clark and F. A. Curtis, former chiefs of the Bureau's paper section, a number of methods had already been developed by the committee and descriptions of them published by the Association. These proved of much assistance in the initial standardization of methods. The system first set up for this purpose was very simple. As soon as a method was developed by the Paper Testing Committee, and approved by a majority of its members, it was distributed by the secretary of the Association for the vote of the members on adoption as an official method. As the work expanded in the development of paper testing standards and other kinds of standards, it became necessary to improve the system, and finally the present set-up of a Standards Committee and divisions dealing with different kinds of standards, and other improvements, were evolved. This system is working very satisfactorily.

"There are now 63 TAPPI methods for testing paper and paperboards and back of them is a vast amount of research and testing so that on the whole they are good. The frequent revisions of them show that they are under constant scrutiny and that every advantage is taken of experience in their use, and of advancement in technical knowledge, to improve them. In his published notice of the award of the TAPPI medal to me, your sec-

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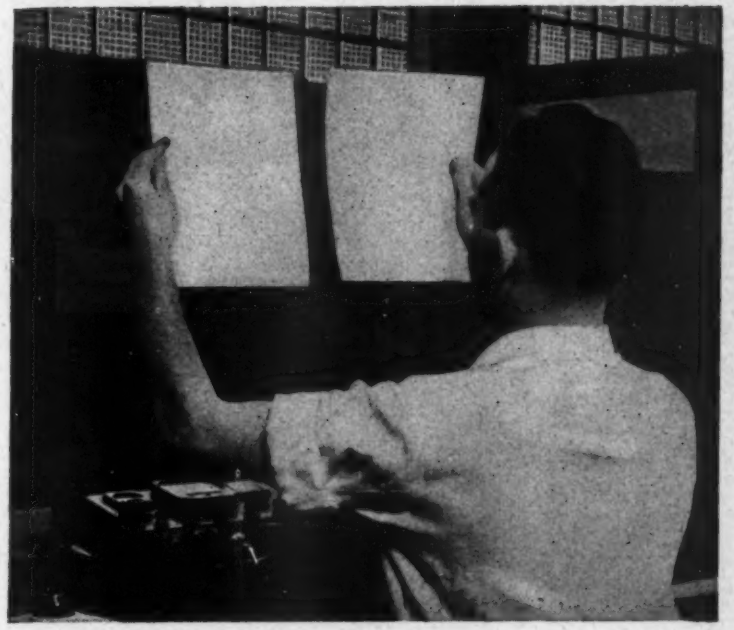
Visual as well as laboratory testing of paper formation establishes the necessity for using a pure, uniform "Alum" in manufacturing a high-grade sheet.

General Chemical Aluminum Sulfate—as well as the Company's other paper-making chemicals—is made with strict attention to every production detail. Constant laboratory control assures product uniformity and purity. For "Alum" you can rely upon, specify **General Chemical:**



aluminum sulfate

Standard—Lump; Ground, 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh.

Iron Free—Lump, approx. 2½"; Ground, thru 8 mesh.

sodium silicate

Solutions: From 38°—60° Baume

Wt. Ratio (Na_2O to SiO_2) from 1:2.00—1:3.40

Appearance: Opalescent to clear.

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retary made the following statement: "The existence of these established and universally recognized testing methods has been a direct contribution to the war effort in their use in preparing the Army and Navy paper and packaging materials specifications, since but little time or technical manpower had to be utilized during the emergency by the Government procurement agencies in developing uniform acceptable test procedures." Because of my close association with the federal specifications as chairman of the committee for paper and paper products, and as a consultant for other special specifications for such supplies required by the Army, Navy and other war agencies, I can testify to the truth of this, and would add that the procurement of this kind of war materials of satisfactory quality would have been seriously delayed had the TAPPI testing methods not been in existence. They assist the purchaser of paper in definite specification of what he wants and this gives the papermaker something definite to work to.

"Most of the results of the work of the National Bureau of Standards on paper testing has been incorporated into TAPPI testing methods and this is appreciated by the Bureau as the results are thus made more effective than they would be otherwise. The establishment of the Institute of Paper Chemistry by the paper industry assisted materially in the development of the TAPPI testing methods. The extensive researches of the Institute in this field have been productive of much information of great value. In closing I wish to take this opportunity to gratefully acknowledge the invaluable assistance in the work of the Paper Testing Committee, of your Secretary, R. G. Macdonald; R. C. Griffin, Chairman of the Standards Committee; James d'A. Clark, Chairman of the Testing Division, and all the members, past and present, of the Paper Testing Committee and subcommittees."

◆

▶▶▶ THE USUAL TYPE of convention has been dispensed with by The International Association of Printing House Craftsmen, Inc. Instead, the board of governors of this body has voted to hold a two-day business meeting in Columbus, Ohio, on August 6-7. Since government restrictions limit the attendance at such meetings to 50, each local club will be limited to only one delegate. No visitor will be permitted to register or attend any of the sessions.

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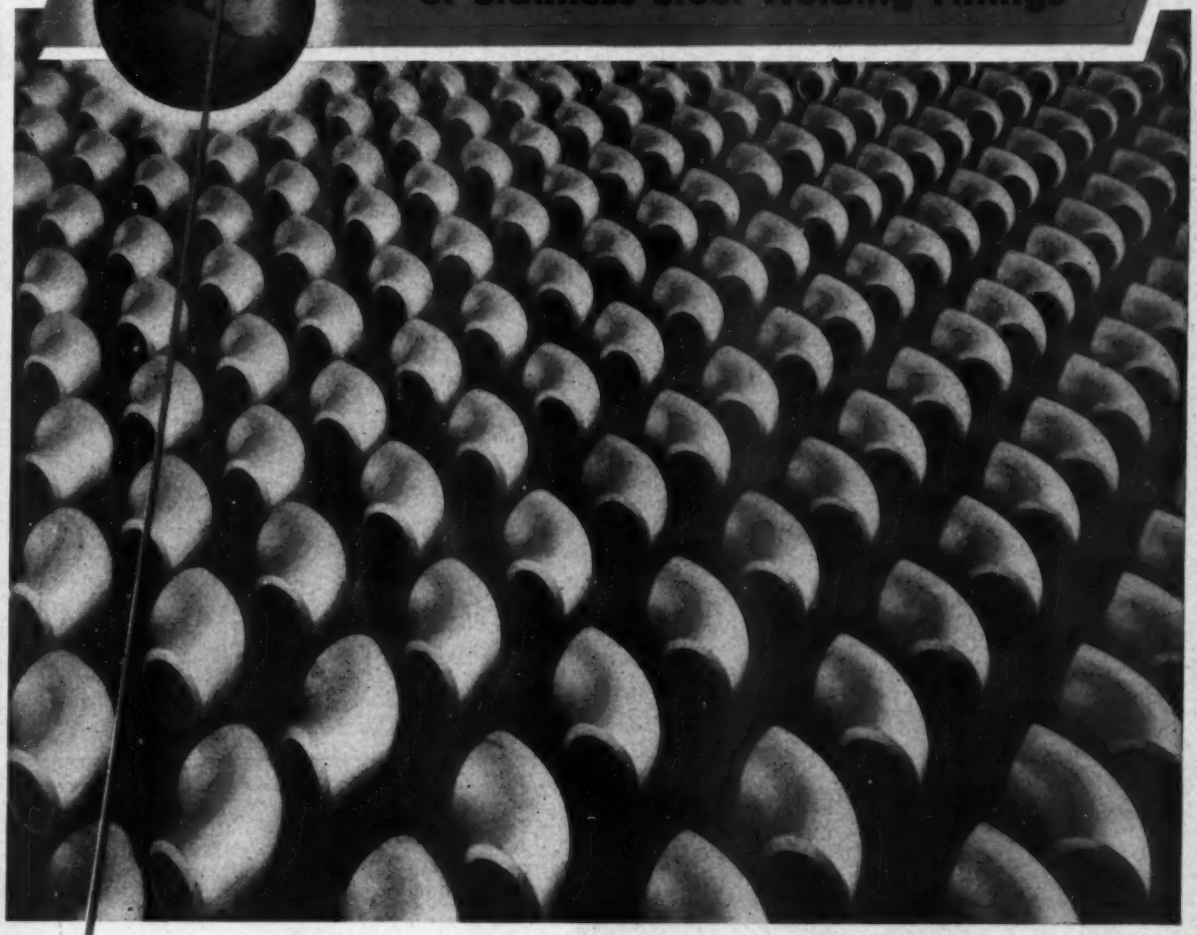
of Stainless Steel Welding Fittings



THE Stainless Steel Division of Pittsburgh Piping & Equipment Company manufactures a complete line of stainless steel welding fittings. 45° and 90° Elbows, 180° Return Bends, Reducers, Tees, Caps, and Lap-joint Nipples, are available in Stainless Types Nos. 304, 316, 321, 347; also furnished in other analyses. I.P.S. sizes range from 1/2" to 10"; tube sizes from 1" to 24" diameter.

These fittings are annealed, blasted, and passivated for best corrosion resistance. The ends are accurately machine cut and beveled to 37½° with approximately 1/16" straight face. The radius of each Elbow is 1½ times the nominal pipe diameter.

Use of Pittsburgh Piping & Equipment Company Stainless Steel Fittings assures dimensional accuracy in your sub-assemblies and greatly simplifies field erection.

Send us your specific requirements. We will give you complete information promptly, without obligation.

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DO MORE THAN BEFORE—BUY EXTRA WAR BONDS

Secretary-Treasurer's Report to TAPPI

R. G. MACDONALD

▸▸▸ THE TECHNICAL ASSOCIATION of the Pulp and Paper Industry in 1944 continued to devote its principal efforts to assisting the industry and the wartime agencies of the Government.

Membership

The number of members in the armed services was increased considerably during the year. A record of these individuals was published once more in the TAPPI Year Book.

There were 242 individual members elected in 1944, 110 members resigned or were dropped. On December 31, 1944, the total individual membership was 2,128.

There were 11 corporate and 15 sustaining members elected. There were no company resignations. The corporate membership on December 31, 1944, was 136, and the sustaining membership was 125.

The following companies became corporate members in 1944: North American Pulp and Paper Company, Cheboygan, Mich.; Ohio Boxboard Company, Rittman, Ohio; The Marvellum Company, Holyoke, Mass.; H. P. Smith Paper Company, Chicago, Ill.; Hazen Paper Company, Holyoke, Mass.; Specialty Papers, Inc., East Braintree, Mass.; River Raisin Paper Company, Monroe, Mich.; Gummed Products Company, Troy, Ohio; Shellmar Products Company, Mt. Vernon, Ohio; Tested Papers of America, Inc., Chicago, Ill., and Brittains, Ltd., Staffordshire, England.

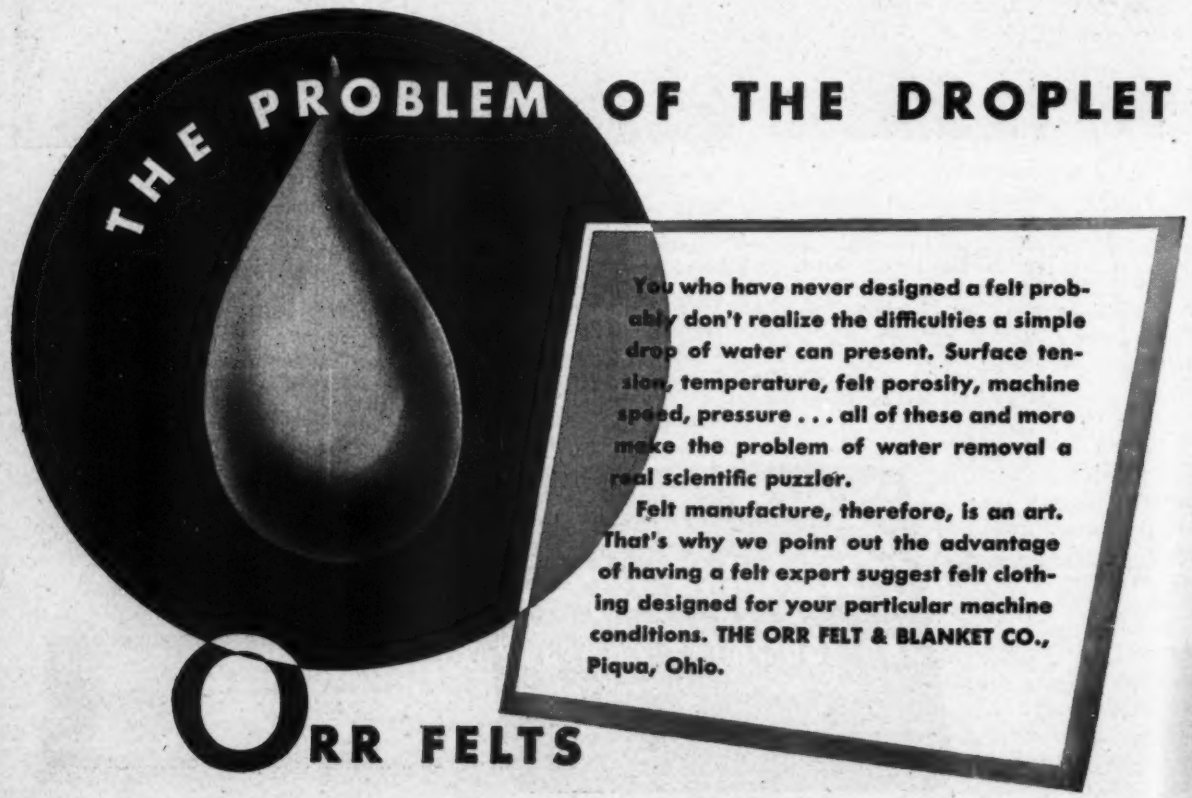
The following companies became sustaining members in 1944: Signode Steel Strapping Company, Chicago, Ill.; *Southern Pulp and Paper Journal*, Atlanta, Ga.; Wm. Cable Ex. Wire Company, Brooklyn, N. Y.; Kidder Press Company, Inc., Dover, N. H.; J. E. Rhoads & Sons, Philadelphia, Pa.; General Printing Ink Company, New York, N. Y.; Warren Steam Pump Company, Warren, Mass.; Allis-Chalmers Mfg. Company, Milwaukee, Wis.; Lombard Governor Corporation, Ashland, Mass.; Lobdell Company, Wilmington, Del.; Goslin-Birmingham Company, New York, N. Y.; Norton Company, Worcester, Mass.; Buffalo Electro-Chemical Company, Buffalo, N. Y.; Rust Engineering Company, Pittsburgh, Pa., and the Railway Supply and Manufacturing Company, Cincinnati, Ohio.

Corporate members that have joined the Association since January 1st include: Standard Cap and Seal Company, Chicago, Ill.; Dianda & Cia, Ltda., Sao Paulo, Brazil; E. S. & A. Robinson, Canada, Ltd., Toronto, Ont., and the Brown Company, Berlin, N. H.

Sustaining members that have joined since January 1st include: The Bevis Machine Company, Middletown, Ohio; John Waldron Corporation, New Brunswick, N. J.; Magnus Chemical Company, Garwood, N. J.; Orr Felt and Blanket Company, Piqua, Ohio; Carthage Machine Company, Carthage, N. Y.; the Kalamazoo Tank & Silo Company, Kalamazoo, Mich., and Link-Belt Company, Chicago, Ill.

Necrology

The Association lost through death the following members: Ben Alexander, Masonite Corporation; Edgar H. Bristol, The Foxboro Company; Robert Caldwell, J. & J. Rogers Company; Charles H. Cashmore, Paterson Parchment Company; Alfred B. Clark, J. O. Ross Engineering Corporation; Frederick Grewin, Holmens Bruks & Fabriks; Henrick Grinstad, Brompton Pulp & Paper Company; James L. Jardine, James Brown & Company, Ltd.; M. M. Klosson, Buffalo Pumps, Inc.; Harold W. Knight, Bulkley, Dunton


THE PROBLEM OF THE DROPLET
You who have never designed a felt probably don't realize the difficulties a simple drop of water can present. Surface tension, temperature, felt porosity, machine speed, pressure . . . all of these and more make the problem of water removal a real scientific puzzler.
Felt manufacture, therefore, is an art. That's why we point out the advantage of having a felt expert suggest felt clothing designed for your particular machine conditions. THE ORR FELT & BLANKET CO., Piqua, Ohio.
ORR FELTS

MOISTURE CONTENT, TOO, IS "*Calipered*" CONTINUOUSLY!

Typical installation of Verigraph Control Instruments (left). By a simple setting of one knob, dryers can be made to maintain any specified moisture content in the sheet.

With the Foxboro Verigraph, sheet moisture can be measured and controlled as accurately as sheet thickness!

In more than 250 paper mill installations throughout the U. S. and Canada, Verigraph Moisture Control Systems are on the job – continuously measuring the moisture content of all grades of paper, and regulating dryers to maintain uniform, specified moisture content during manufacture. They are *the only* equipment that will perform these functions and provide a continuous moisture record.

An exclusive Foxboro development, Verigraph Moisture Control Systems apply the unique speed and sensitivity of electronic operation to moisture measurement. They provide instant control action for moisture variations as small as 1/10 of 1%.

Users depend on Verigraph Control to avoid blackening, breaks, curl, and dimensional changes – to gain strength, finish, and uniformity of product.

Write for the full story in illustrated Bulletin 212-2. Or call in a Foxboro Engineer from the nearby Foxboro Office to talk it over. **The Foxboro Company, 158 Neponset Avenue, Foxboro, Mass., U. S. A.** Branches in principal cities.

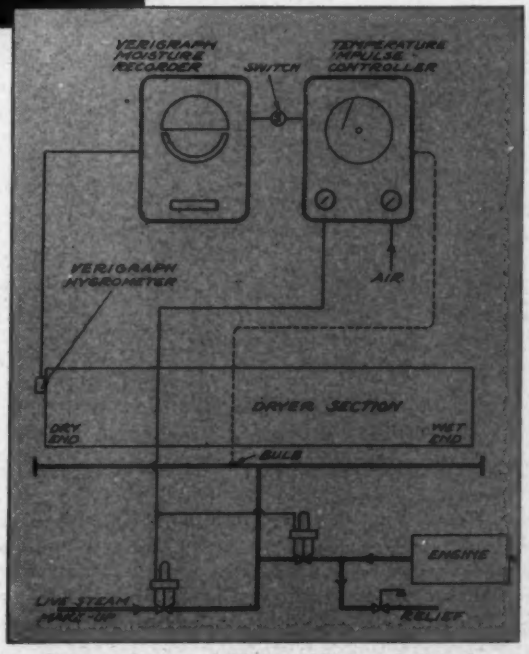


Diagram showing application of Verigraph Control on single section dryer.

FOXBORO REG. U. S. PAT. OFF. — **VERIGRAPH MOISTURE CONTROL**

Pulp Company; Harry D. Mitchell, Link-Belt Company; Murray M. Rubin, American Tissue Mills; Howard Lobdell Seaman, Lobdell Company; D. E. Scott, Chase Bag Company; Arthur F. Smith, General Electric Company; Herbert L. Thompson, Louis De Jonge Company; C. W. Heppenstall, the Heppenstall Company, and R. E. Demmon, Stauffer Chemical Company.

Special Reports on Manufacturing Problems

For the past twenty-five years the Association has conducted a reporting service based on surveys, questionnaires and investigations relating to pulp and paper mill problems. These reports are sent to individuals who supply information for their compilation and to the corporate members. In 1944 the following reports were issued:

No.

337 Enzyme Conversion of Corn Starch.

338 Alignment of Cylinder Machine Press Rolls.

339 Effect of Calender Roll Diameter and Weight on Finish.

340 Relative Merits of Engine Sizing and Tub Sizing.

341 Printing Difficulty Caused by Groundwood Shives.

342 Operation of Supercalenders.

343 Disposal of Sulphite Waste Liquor.

344 Stone Roll Breakage.

345 Stuff Preparation in Beaters *vs.* All-Jordan System.

346 Calcium Carbonate in Coating.

347 Use of White Water for Cylinder Machine Showers.

348 Effect of Alum Treatment of Hard Water.

349 Life of Sulphite Digester Linings.

350 Brown Stock Washing in Sulphate Mills.

351 Satin White in Coating.

352 Felt Whippers.

Employment

The number of jobs open at all times during the past year far exceeded the demand. This was largely due to full employment by the industry and the large number of members in the armed services. The Association, for many years, has conducted an active free employment service and has been the medium for placing several hundred individuals on jobs. When seeking employees such as managers, chemists, superintendents, engineers, etc., companies should notify the Technical Association secretary.

Fall Convention

Although it was not publicized, it was the intention to hold the fall meeting again in Chicago. Transportation and hotel difficulties caused a number of members to recommend that no meeting be held. This proposal was submitted to the membership for vote and with nearly the unanimous consent of the members voting, this prospective meeting was cancelled.

A number of the Association's committees took advantage of this situation and held meetings to discuss their own projects. The Pulp Purification Committee met at Buffalo, N. Y., on October 13, 1944, during the convention of the Electrochemical Society. The Alkaline Pulping and the By-products Committees met jointly at the De Soto Hotel, Savannah, Ga., on October 18-20, 1944. More than 100 attended and discussed a number of technical papers and subjects. The success of this meeting was largely due to the efforts of G. W. E. Nicholson, K. G. Chesley, R. H. Stevens and Kirk Sutlive. A feature of the meeting was a visit to the mill of the Union Bag and Paper Corporation in Savannah.

Other committees to hold meetings since the annual meeting included the Coating, Heat and Power, Materials of Construction, Nonfibrous Materials Testing, Water Vapor Permeability Testing and Acid Pulping committees.

Research Promotion

Because of wartime difficulties no research projects were directly financed by the Association during the year. Committee chairmen were recently advised to consider committee projects and to apply for financial assistance, if necessary, to carry on their work.

Publications

The publication activities of the Association are rather extensive and can not be given much space in this report. They are reported in detail in the 1945 *TAPPI Year Book* (394 pages), in which is cumulatively recorded all the publications that have been issued by the Association.

Technical Association Papers (836 pages) was issued late in the year. Although it was ready for publication in June, printing plant and bindery manpower and other problems caused a delay of several months in preparing it for distribution. This volume contains the papers presented at the 1943 fall meeting, the 1944 annual meeting and the stenographic transcript of the discussion. It is one of the largest single volumes of technical information issued by any professional society. It is bound in cloth.

The *Paper Trade Journal* has continued to be a medium for the publication of many of the Association papers. A section in each issue is devoted to such papers. The Association is indebted to George S. Macdonald, president of the Lockwood Trade Journal Company, and Henry J. Berger, Editor of the *Paper Trade Journal*, for considerable assistance in its publishing program.

The Bibliography of Papermaking and U. S. Patents for 1943, another cloth-bound volume (223 pages) was also issued. This brings the index of technical articles and patents relating to pulp and paper up to date and maintains the record covering the period from 1900 to the beginning of 1944, a record not reached by any other industry. All of this remarkable bibliographic work is due to the untiring efforts of Clarence J. West, of the Institute of Paper Chemistry. Plans are under way to issue a collective bibliography in 1946 to cover the ten year period 1936-1945.

Sixty-one Standard Testing Methods were issued. Because of the needs of the Army, Navy and other Government Procurement Agencies the Association has been particularly active in developing standards. These are needed in the preparation of materials procurement specifications. The loose-leaf system used by the Technical Association in issuing its standard methods provides a convenience and a means of keeping always up to date since new methods may be added at any time and obsolete methods discarded.

Thirty-six Engineering Data Sheets were issued in 1944. These, while miscellaneous in character, are carefully selected and prepared. Eventually these sheets will probably be incorporated in an industry handbook of considerable value. An attempt is made to avoid the material usually found in engineering handbooks.

The TAPPI Bulletin continued to be issued on a semi-monthly basis in 1944. This four-page periodical is prepared to keep the average member abreast of technical developments related to the industry. During the war period it features material of immediate importance to companies acting as Government contractors. It is the most convenient source of information concerning the Government paper and packaging specifications. Each Bulletin contains a feature item that reports in semi-popular style the most recent technical developments. Its restricted size obviates the use of research data but it serves as a guide to such material. It does not attempt to cover articles readily accessible to most of the members.

Monographs

No new monographs were issued during the year. Two have been is-

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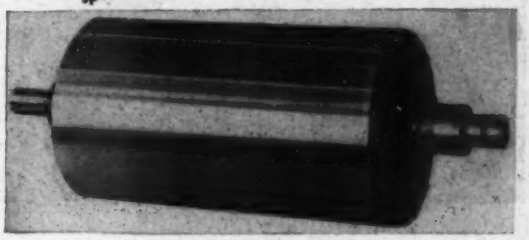
"WELDCO" is the trade name of The Youngstown Welding & Engineering Company, specialists since 1912 in fabricating alloy steels and other corrosion resisting metals.

The Youngstown Welding & Engineering Company specializes in fabricating equipment from alloys.

Weldco chain and accessories made of corrosion resisting metals.

Weldco welded tubing and fittings in standard or special sizes, 3" I.P.S. and larger, of alloy materials.



Rolls for paper mills and other industries are covered with Monel, stainless steel, etc. to resist corrosion and to give longer life.

HERE'S WHAT WELDCO CAN DO FOR YOU

American industry is chock-full of chronic production delays due to equipment and product failures which result from rust and corrosion. Practically alone in its specialized field, The Youngstown Welding & Engineering Company designs and builds special parts and equipment of all kinds of corrosion resisting metals. After 33 years' experience, Weldco engineers know what metal will meet best your combined corrosion and production problem. In a large, well equipped plant, men who "know how" fabricate these tricky metals into dependable equipment. Remember the cost of corrosion is far more than the cost of Monel, Inconel, Stainless Steel and other metals used properly.

So let Weldco engineers help you; write today stating your problem.

Weldco engineers will design and build large or small, special or standard equipment to help solve your corrosion problems. A partial list of Weldco products made of corrosion and rust resisting Monel, Inconel, cupro nickel, nickel, stainless steel, and alloys are: tubing, fittings, chain and accessories, pickling and heat treating crates and baskets, steam jets, tanks, kettles, agitators and miscellaneous rolls. WRITE FOR LITERATURE, stating your problem.

WELDCO *Specialists in Corrosion Resistance*

THE YOUNGSTOWN WELDING & ENGINEERING CO.

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sued, one dealing with *Industrial Water for Pulp, Paper and Paperboard Manufacture* and the other with *Saving Fourdrinier Wires*. Other monographs are in preparation, most notably one dealing with the details of paper coating.

Manufacture of Pulp and Paper

The textbooks on the *Manufacture of Pulp and Paper* issued by the McGraw-Hill Book Company were originally prepared and have been kept up to date under the supervision of the Joint Textbook Committee of the United States and Canada. At present several committees of the Technical Association are working on the next general revision, which will be published after the war.

Local Sections

No new sections were organized in 1944. The seven existing sections (Pacific, Lake States, Ohio, Kalamazoo Valley, Empire State, New England and Delaware Valley) continued to hold meetings, although in some cases on a restricted basis. The Empire State Section has held regular regional meetings at Glens Falls, Watertown and Syracuse. Recently another group was organized and has held a meeting at Niagara Falls. In New England meetings were held at Pittsfield, Holyoke, Springfield, Fitchburg and Boston to permit members to attend without having to travel long distances. On the Pacific Coast there has been a similar arrangement. The Maine-New Hampshire Group has held meetings and should be eligible for section status in the near future. The Chicago Professional Paper Group had a successful year, and although not a TAPPI Section at present, may eventually qualify.

Wartime Activities

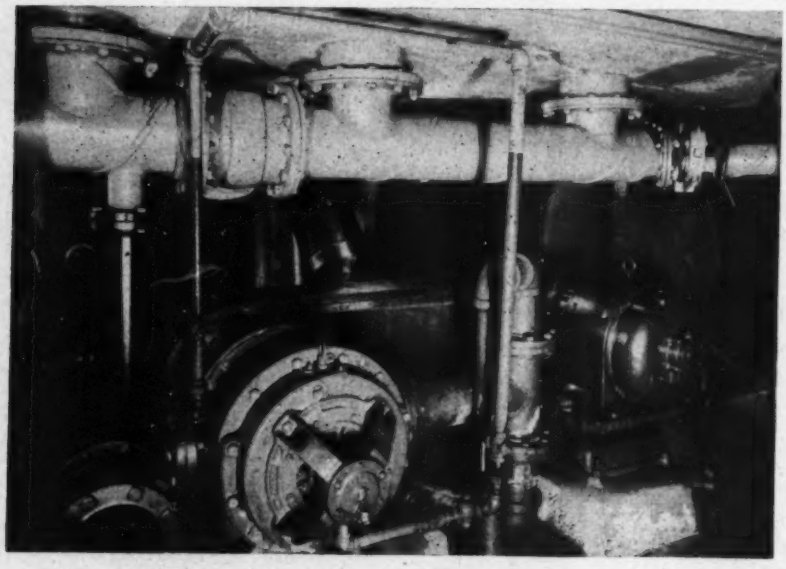
Like other technical societies, the Technical Association has been frequently called upon to assist the various agencies of the Army, Navy and other branches of the Government. Much of this assistance has been of a confidential nature and cannot be publicized.

In the TAPPI Bulletin, already mentioned, the Association has kept the industry up to date regarding currently issued procurement specifications.

The Association has assisted the War Prisoners' Aid (Y. M. C. A.) in obtaining copies of papermaking texts, especially old issues of the Manufacture of Pulp and Paper for use of American prisoners in German internment camps.

On November 3 representatives of TAPPI and the ASTM met with representatives of the Army, Navy, War Production Board and other Government agencies to decide what testing methods do not exist and are most urgently needed in connection with the preparation of specifications and to decide how they should be brought into being. A special task committee of the Technical Association was organized to proceed with this work and individuals were assigned to work on each of the methods most urgently needed. This work has been proceeding under the general direction of Major James d'A. Clark, Chicago Quartermaster Depot, chairman of the TAPPI Testing Division; W. H. Graebner, Marathon Corporation, chairman of the Packaging Materials Testing Committee; Don L. Quinn, chairman of the Container Testing Committee; and B. W. Scribner, National Bureau of Standards, chairman of the Paper Testing Committee. These committees are working closely and satisfactorily with the Army Packaging Board, the Navy, and the Container Co-ordinating Committee of the War Production Board.

A special task committee, under the chairmanship of Peter J. Massey of the H. P. Smith Paper Company, cooperated with a committee of the So-



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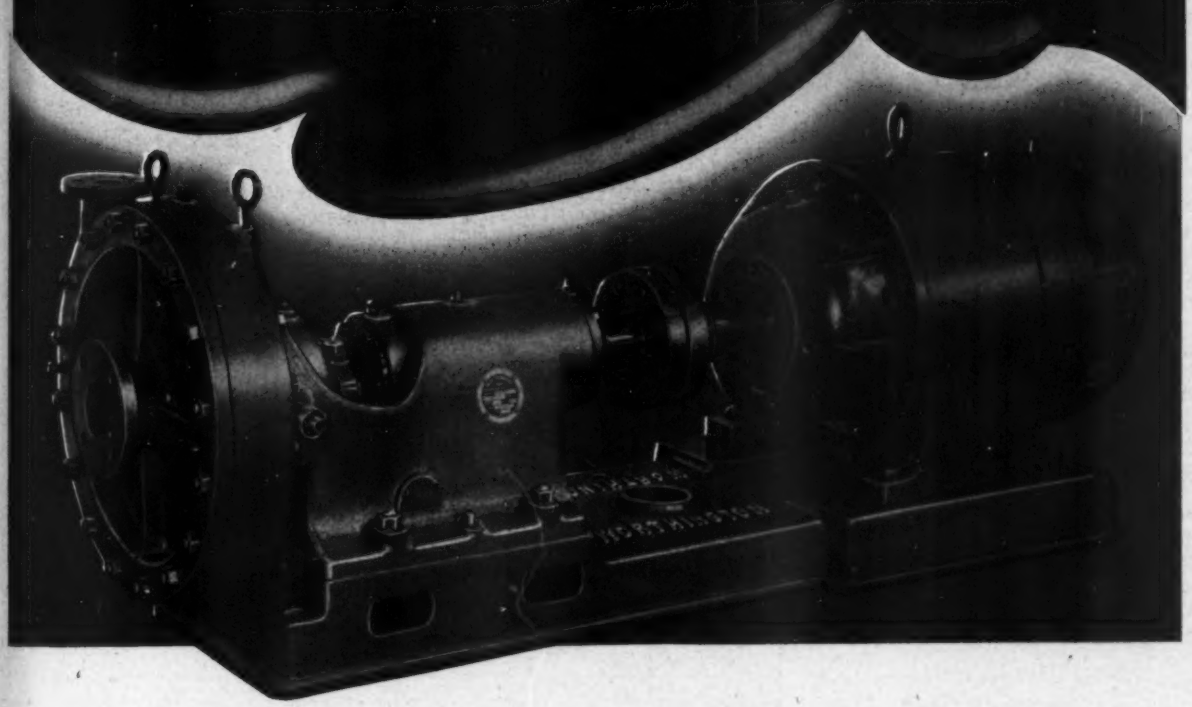
BLACK LIQUOR CAME OUT OF THE RED



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Black sulphite liquor—corrosive, abrasive, hot, foamy *and* with a tendency to solidify on cooling—is mighty troublesome to handle, but mighty profitable when handled right.

Black liquor is on the profit side of the ledger, in many mills today, with the help of the Worthington Type CH centrifugal pump—at present the only pump that handles it with complete success.

Valuable by-products for the coming age of "wood conversion" may be under consideration in your mill. When it comes to pumps—get in touch with a Worthington Pump Application Engineer.

"WORTHINGTON BUILDS 'EM ALL"

In addition to solving especially difficult pumping problems, a Worthington P. A. E. is best able to recommend the right pump for you—since Worthington makes *all* sizes and types of centrifugal pumps for *every* pulp and paper process.

Write or call our nearest District Office.

Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.

*Pump Application Engineer

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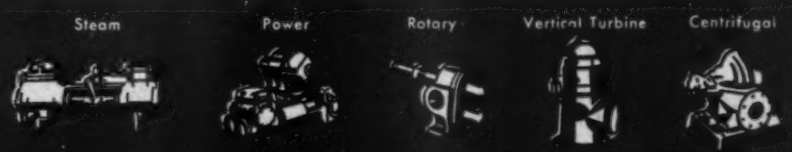

ciety of Automotive Engineers in developing paper specifications and tests for special wrapping papers for antifriction bearings. This work was of particular value to the Office of the Chief of Ordnance and the Army Air Forces.

During the year the Association has responded to requests from such organizations as the Chicago Quartermaster Depot, San Diego Naval Air Station, Minneapolis Area AAF, Office of the Chief of Engineers, Production and Engineering Section AAF, Curtiss-Wright Corporation Propeller Division AAF, Wichita, Kan., Midwestern Procurement Districts, Jeffersonville (Ind.) Quartermaster Depot, Edgewood Arsenal CWS, Quartermaster Climatic Research Laboratory (Lawrence, Mass.), Technical Service Command AAF (Wright Field), Philadelphia Signal Corps Depot, Specifications Section Signals Production Branch, Dept. of Munitions and Supply (Ottawa, Canada), Technical Investigations Branch, British Air Commission, Naval Clothing Depot (Brooklyn, N. Y.), Jersey City Quartermaster Depot, Containers Division, Bureau of Supplies and Accounts, Navy Dept., Naval Aircraft Factory (Philadelphia, Pa.), Rubber Reserve Corporation, War Food Administration and others.

Institute of Paper Chemistry

Excellent co-operation has marked the relationship between the Association and the Institute of Paper Chemistry. Several members of the Institute staff are taking a leading part in Association committee work and are serving on task committees co-operating with the war agencies. The Association has contributed financially to the Institute.

Divisions and Committees

Even under the difficulties encountered in the everyday activities of members, manpower shortages, etc., the committees of the Association have, for the most part, carried on fine work. With the optimism that existed in the past fall relative to the war's progress, many committees felt that they were ready with constructive programs for the future. Some of these were planned for presentation at the 1945 annual meeting and it is to be regretted that the turn in events brought about a cancellation of the annual meeting at the request of the Director of War Mobilization. This was to reduce the heavy pressure on railroad and hotel facilities and to utilize technical manpower on the job to the limit. Although the holding of the annual meeting would have created a great impetus to the committee and Association work, compliance with the Government's request was of imminent importance and the spade work of the committees in organizing such a fine program has established the groundwork for more rapid advances as soon as it becomes feasible to proceed.

Personnel changes in the divisions and committees follow:

Engineering Division: W. G. MacNaughton, Newsprint Service Bureau, general chairman. There were no personnel changes during the year. The present chairmen are: *Heat and Power Committee,* Roderick O'Donoghue, Consulting Engineer; *Drying, Heating and Ventilating Subcommittee,* A. E. Montgomery, J. O. Ross Engineering Corporation; *Production and Transmission of Power Subcommittee,* E. F. Burns, International Paper Company; *Heat Utilization in Chemical Processes Subcommittee,* W. T. Webster, Brunswick Pulp and Paper Company. The name of the *Materials Construction Committee* was changed to *Mill Maintenance and Construction Materials Committee,* James A. Lee, Chemical and Metallurgical Engineering; *Packing Materials Subcommittee,* J. W. Hemphill, Johns-Manville Company; *Piping and Tubing Materials Subcommittee,* S. B. Jones, West Virginia Pulp and Paper Company, and the *Water Committee,* L. B. Miller, W. H. & L. D. Betz Company.

R. G. Macdonald, secretary-treasurer TAPPI

Industrial Division: W. E. Brawn, Pejepscot Paper Company, general chairman. There were no personnel changes in this division. The present chairmen are: *Industrial Engineering,* W. M. Shoemaker, Douglas T. Sterling Company; *Vocational Training Committee,* W. L. Cassiday, Hummel & Downing Company; *Fibrous Raw Materials,* John Traquair, Mead Corporation; *Nonfibrous Raw Materials,* E. N. Poor, American Cyanamid and Chemical Company.

Converting and Consuming Division: J. D. Malcolmson, Robert Gair Company, replaced Arno W. Nickerson, Consulting Engineer, as general chairman; *Coating Committee,* Werner Kaufmann, Kupfer Bros. Company; Arno W. Nickerson replaced J. D. Malcolmson as chairman of the *Container Committee.* R. H. Simmons replaced M. S. Kantrowitz (both of the Government Printing Office) as chairman of the *Graphic Arts Committee.* A new committee to be known as the *Structural Fibrous Materials Committee* was projected. This committee will deal with technical details concerning such materials as insulating and wall boards and insulating bats.

Research Development Division: F. W. Brainerd, Scott Paper Company, succeeded D. W. McCready, University of Michigan, as general chairman; *Abstracst and Bibliography Committee,* C. J. West, Institute of Paper Chemistry; *Engineering Research Committee,* J. B. Gough, Mead Corporation, succeeded D. W. McCready as chairman; *Fundamental Research Committee,* H. F. Lewis, Institute of Paper Chemistry; *Bacterial Control Methods Committee,* R. H. Torrey, Riegel Paper Corporation; *Patents Committee,* C. W. Rivise, Caesar & Rivise; *Plastics Committee,* E. C. Jahn, New York State College of Forestry, became chairman of this newly organized committee.

Pulp Manufacture Division: W. F. Gillespie, Gaylord Container Corporation, succeeded S. D. Wells, Institute of Paper Chemistry, as general chairman; *Acid Pulping Committee,* G. H. McGregor, Minnesota and Ontario Paper Company; *Alkaline Pulping Committee,* K. G. Chesley, Crossett Lumber Company; *Mechanical Pulping Committee,* R. H. Drummond, International Paper Company; *Pulp Purification Committee,* D. T. Jackson, Hammermill Paper Company; *Paper Drinking Committee,* F. C. Clark, Consulting Engineer, became chairman of this committee, and R. H. Stevens of the National Container Corporation became chairman of the new *Byproducts Committee.*

Paper Manufacture Division: Pierre Drewsen, General Chairman; *Papermaking Committee,* A. E. Bachmann, Missisquoi Corporation; *Preparation of Nonfibrous Materials Committee.* This committee has been assigned to the New England Section to be operated as a Section activity. *Straw and Agricultural Cellulose Residues Committee,* S. I. Aronovsky of the Northern Re-

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Wartime transportation peaks have created many problems for manufacturers dependent on the steady flow of chemicals to their plants. Columbia's efficient Traffic Service has done much to minimize these problems for its customers, and to ease their traffic supervision tasks. That's why many a Traffic Manager is in full accord with his company's policy of favoring Columbia as its source of chemical supplies.

By their efficient handling of an unprecedented volume of traffic, the freight carriers have earned the thanks of the entire nation. They stress, however, the importance of the co-operation they have received from their customers. The job has indeed been so vast and so outstandingly successful that all Traffic men—both those employed by carriers and by their customers—can take pride in their contribution to America's war effort.

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ginal Research Laboratory, U. S. Bureau of Agriculture, Chemistry and Engineering.

Testing Division: Major J. D'A. Clark, Chicago Quartermaster Depot, General Chairman. E. R. Schafer, Forest Products Laboratory, succeeded Major B. E. Lauer, Chemical Warfare Service, as chairman of the *Fibrous Materials Testing Committee; Pulp Testing Committee,* L. V. Forman, Institute of Paper Chemistry; *Nonfibrous Materials Testing Committee,* W. F. Hathaway, Kalamazoo Vegetable Parchment Company; *Chemical Methods Committee,* B. L. Browning, Institute of Paper Chemistry; *Microscopy Committee,* F. A. Burningham, Brown Company; *Paper Testing Committee,* B. W. Scribner, Chairman; *Absorptiveness to Paraffin Subcommittee,* S. C. Fairbanks, Hamersley Manufacturing Company; *Testing Instruments Subcommittee,* E. J. Albert, Thwing-Albert Instrument Company; *Writing and Erasing Properties Subcommittee,* P. W. Codwise, Beaver Wood Fibre Company; *Water Penetration Subcommittee,* E. G. Mullen, American Reenforced Paper Company; *Water Vapor Permeability Testing Committee,* W. H. Graebner, Marathon Corporation. (This committee completed its assignment during the year and has been replaced by a Packaging Materials Testing Committee of a somewhat wider scope.) Mr. Graebner is also chairman of a special task committee to develop testing methods for the Government procurement services; *Ordnance Wrapping Special Task Committee on Bearing Wraps* (joint with Society of Automotive Engineers), P. J. Massey, H. P. Smith Paper Company; Don L. Quinn, Consultant, succeeded Arno W. Nickerson as chairman of the Container Testing Committee; A. H. Croup, Hammermill Paper Company, succeeded M. N. Davis, Kimberly-Clark Corporation, as chairman of the Optical Properties Committee.

Special Committees: G. E. Williamson, Strathmore Paper Company, succeeded George Carruthers, Interlake Tissue Mills, as chairman of the Joint Textbook Committee; *Research Appropriation Committee,* J. L. Parsons, Hammermill Paper Company; *Standards Committee,* R. C. Griffin, Arthur D. Little, Inc.

Local Section Chairmen

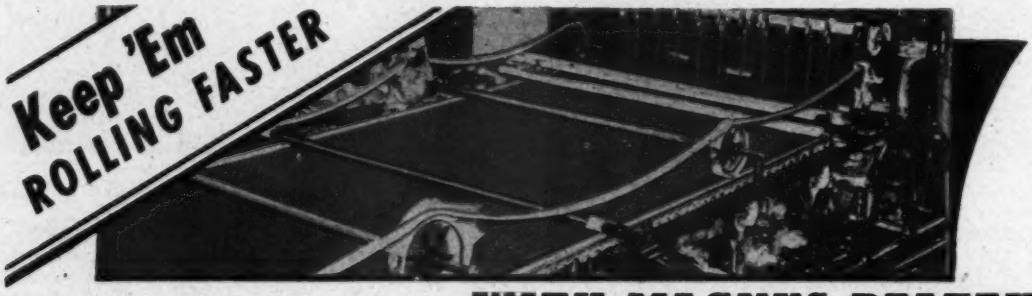
Charimen of local sections elected during the past year include: *Pacific,* Erik Ekholm, Puget Sound Pulp and Timber Company; *Lake States,* J. P. Weidner, Hoberg Paper Company; *Delaware Valley,* A. M. L. Bixler, Riegel Paper Corporation; *Kalamazoo Valley,* E. B. Taylor, Stein, Hall Company; *New England,* W. L. Foote, B. F. Perkins & Sons; *Ohio,* C. D. Roess, Wrenn Paper Company; *Empire State,* F. J. McCourt, International Paper Company; *Maine-New Hampshire Group,* Clifford Patch, Eastern Corporation; *Chicago Professional Paper Group,* Harry E. Weston, Fritz Publications, Inc.; and *Papermakers and Associates of Southern California,* Frank Wheelock, Fibreboard Products, Inc.

◆

NATIONAL INSTITUTE ORGANIZED BY WOOD TANK MANUFACTURERS

Several preliminary meetings of representatives of wood tank manufacturers have resulted in the organization of a corporate body known as the National Wood Tank Institute.

Samuel Emmons Chaney, formerly field engineer for the California Redwood Association of San Francisco, was appointed executive director, with offices at 1329-30 Monadnock Building, Chicago 4, Illinois. Mr. Chaney has a wide experience that will be very valuable to the members of the Institute, as well as to the users of wood tanks.



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When you use Magnus Beatex in the beater, you do quite a number of things that help increase production and help hold the increased rate.

Beatex first of all puts water into your stock faster. Beating time is reduced and there is less work for the jordan.

Beatex also increases retention of short fibres on the wire, boosting yield and improving formation. More size, color and filler are retained in the web. Dewatering of the web on the machine is faster when Beatex is used, because of its effect in reducing the surface tension of the stuff.

Beatex has many other advantages, all covered in detail in the Magnus Paper Mill Handbook, but one other point deserves emphasis here: When Beatex is used it tends to keep the system *clean.* If you start using Beatex in a clean system, you'll find that you'll have mighty little trouble with production delays due to slime.

Ask us for complete details on Beatex and a copy of the Magnus Paper Mill Cleaning Handbook. Please specify the type of sheets you make, since Beatex is not applicable to all kinds of paper.

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Paper Mill Cleaners

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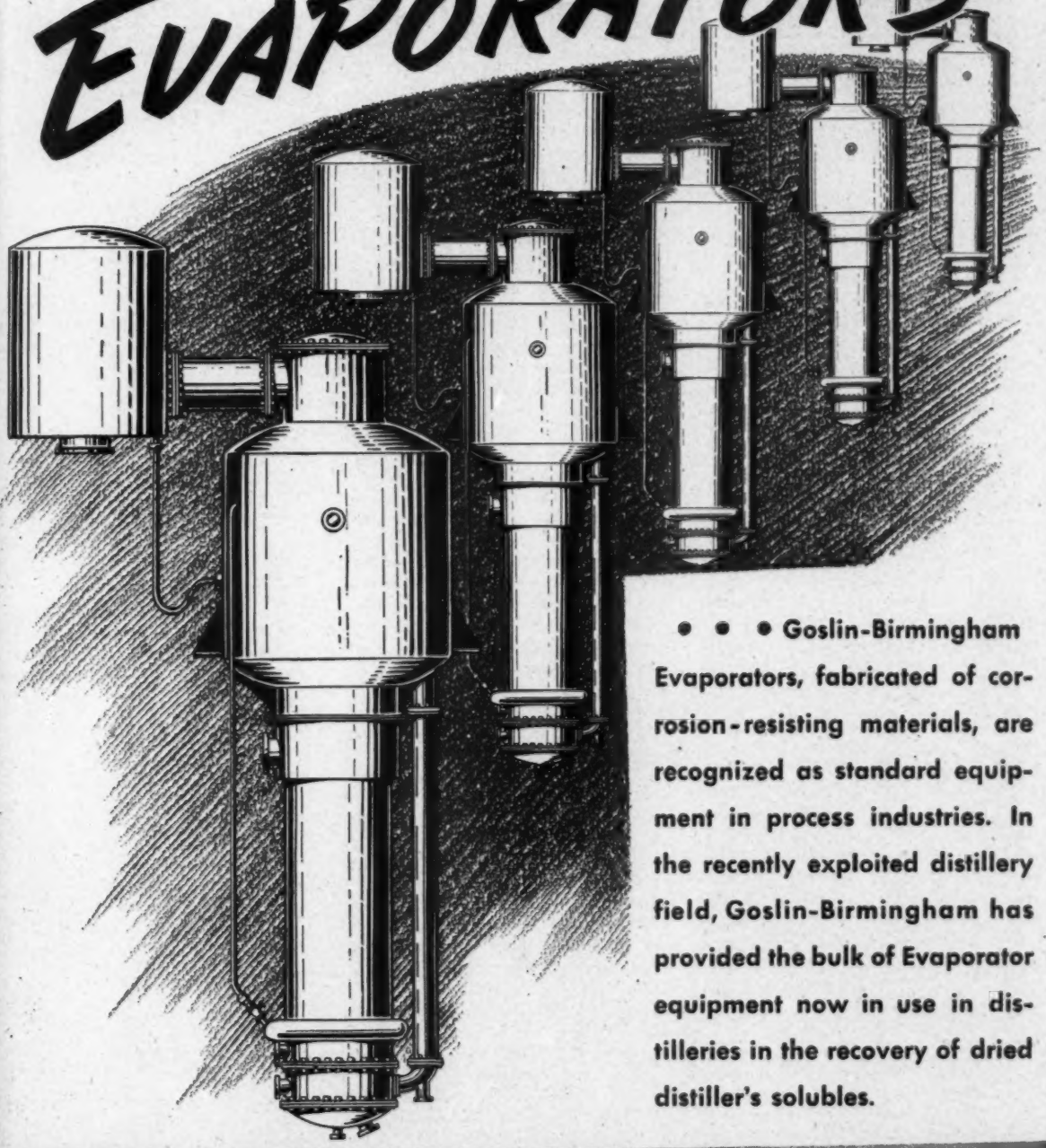

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Salesmen's Association Holds Abridged Meeting

▶▶▶ THE SALESMEN'S Association of the Paper Industry held its abridged annual meeting at the Waldorf-Astoria Hotel on February 19 and elected Stanley O. Styles, of the Martine Cantine Company, Saugerties, N. Y., president to succeed Burt B. Fisher, of the Bergstrom Paper Company, Neenah, Wis.

Other elections were: Eastern vice president, E. F. Miles, Crocker-McElwain Company; assistant eastern vice president, Allen B. Helffrich, St. Regis Paper Company; western vice president, F. D. Patterson, Flambeau Paper Company; assistant western vice president, E. J. Edwards, Howard Paper Company. Dr. E. O. Merchant was again chosen secretary-treasurer.

President's Annual Report

Burt Fisher, the Association's retiring president, delivered the following annual report.

At the outset, I wish to pay tribute to the other officers and committee chairmen of this Association, and indeed to the entire membership. At no time during the past year was cooperation or help denied me. At all times, there was a wonderful spirit of enthusiasm and a willingness to sacrifice personal time and effort for the advancement of the Association. This true of Eastern and Western members and officers alike and everytime there was a special task to be assigned, it was done willingly and capably. To all of you, I extend my personal thanks for your help.

In 1944 as in 1943, the outstanding activity of this Association has been in the field of Public Relations. A special committee has been at work during this past year and, in my opinion, we have made definite progress.

After the interest generated during the meetings last February and at our Annual Luncheon, our committee decided that our chief function for a time would be to keep the interest alive—particularly with respect to the Board of Governors and Officers of the American Paper & Pulp Association. I am positive that it was due principally to our efforts, that the AP&PA appointed a committee to study this subject, and after studying to make a report to the Board of Governors. The Committee's report was issued during the summer and, while not satisfactory to us, it was nevertheless evidence of the fact that the broad subject of Public Relations for the paper industry was at last under definite consideration by the executives and policy makers of the industry. The committee did, however, purpose to the Board of Governors of the AP&PA that it hire, on a full time basis, an expert in Public Relations to aid and assist them in inaugurating a program.

After issuance of the AP&PA report, Mr. Dan Brown, the President, invited the Salesmen's Association Public Relations Committee to write him a letter and incorporate in it any comments or criticisms we felt were necessary with respect to his committee's report. This, to my knowledge, was the first time the Salesmen's Association had been given, from the top, a definite assignment. For the first time, we had a green light to express our views with the assurance they would be given weight and consideration by the Board of Governors of the AP&PA.

Our committee immediately got busy and although we were invited to write a letter, by the time we completed our deliberations, we had material aplenty for a complete report. This report was sent to Mr. Brown on November 25, and it contained our conception of what a Public Relations campaign should be, with particular emphasis on the paper industry, and by so doing pointed out where our views were different than those expressed by the committee from the AP&PA. Mr. Brown and other members of the Board of Governors of the AP&PA have written us thanking us for our report and I have every reason to believe it received favorable comment in their discussion of it. Prior to issuing our report, the AP&PA had not hired the Public Relations expert referred to above and whether or not our report had anything to do with it, the fact remains that not long after our report was circulated, Col. Schell was hired and is now at work.

It is my opinion we are definitely making progress. The membership of the present committee on Public Relations is hereby dissolved and it will be the privilege of the new president to name his own committee. Though it will take time, I firmly believe we are pursuing this project in the proper manner and I am confident that eventually our ideas will prevail.

You have heard or will hear the reports of the other officers as well as the chairmen of the various committees. The sum total of these reports indicate definite progress during this past year. I wish to direct your attention particularly, however, to the report of the treasurer and the report of the chairman of the Membership Committee. The two go hand in hand and I suggest to the new officers that special attention be given to a campaign for new members. We are certainly achieving recognition and stature in the industry and I agree with Mr. Gibson when he says that we should have not less than 500 active members.

This past year is the first one, I think, in which our president has not lived, during his term of office, in either New York or Chicago. This has many disadvantages and I don't know as I would recommend it as a future policy. Many times I have felt rather out of touch with the week-to-week Association affairs, and generally speaking, I think it is wiser to have a president who is on the spot and can thereby be in closer contact with the other officers to help them in directing policy, making decisions, and be of aid in whatever problem arises.

There is, however, one advantage to having your president reside elsewhere than New York or Chicago. He is, so to speak, on a hilltop looking at the Association as a whole. He can then be concerned with the entire forest and not with a few individual trees. We have, in fact, two separate and distinct organizations which, aside from the annual New York meetings and luncheons, pretty largely go their own separate and distinct ways. Occasionally the New York and Chicago divisions do not see eye to eye on a specific problem and are, therefore, inclined to express different viewpoints and take different action, each in accordance with its own interests. I think that during this past year, and I certainly cast no reflection on any past president either in New York or in Chicago, we have had more unity in our *whole* Association than formerly. In our Public Relations proposal, we are making an appeal to the entire paper industry for unity. Certainly, therefore, the Salesmen's Association must set a good example by presenting a unified front to the rest of the paper industry. Therefore, I appeal to the new officers and to all the members, both east and west, to take the time to consider the other fellow's viewpoint and by open and free discussion, honestly and sincerely presented, arrive at an effective compromise whenever a controversial subject is under consideration.

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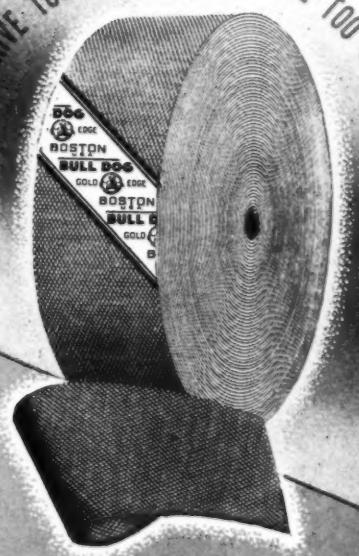
Bull Dog meets the severest requirements of endurance, adaptability, long life, and minimum operating expense.

Bull Dog is widely used in paper and board mills, stone-crushing plants, cement mills, the lumber industry, ore-crushing and refining plants, brick plants, planing mills, and the textile industry. It is well worth your investigation for any driving need.

NO DRIVE TOO HARD • NO SERVICE TOO SEVERE



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Divisional Groups Elect Officers

Writing Paper Manufacturers Association

▶▶▶ FOR THE FIRST TIME in the memory of those living, the Writing Paper Manufacturers Association did not hold its annual meeting this year. Because of Mr. Byrnes' request to cancel all meetings having an attendance greater than 50 people, the 84th annual meeting of the Writing Paper Manufacturers Association was cancelled. In its stead, the Executive Committee of the Association met at the Waldorf-Astoria Hotel in New York City on February 19. At this meeting the mail votes on the nominations previously submitted to members of the Nominating Committee were tabulated, and the following were declared elected as officers and members of the Executive Committee for the ensuing year:

President, H. H. Hanson, of W. C. Hamilton & Sons, Miquon, Pa., succeeding John D. Zink, of the Strathmore Paper Company, West Springfield, Mass.; *Vice Presidents*, M. D. Bardeen, of the Lee Paper Company, Vicksburg, Mich., and W. J. Garrity, of The Munising Paper Company, Chicago, Ill.; *Executive Secretary and Treasurer*, Morris C. Dobrow, of New York, and *Assistant Secretary*, G. V. Johnson (in absentia).

Executive Committee, Messrs. Hanson, Bardeen and Garrity, and H. R. Baldwin, Hammermill Paper Company, Erie, Pa.; H. V. Burgee, Parsons Paper Company, Holyoke, Mass.; D. D. Coffin, C. H. Dexter & Sons, Inc., Windsor Locks, Conn.; A. C. Gilbert, Gilbert Paper Company, Menasha, Wis.; Normal Harrower, Linton Brothers & Co., Fitchburg, Mass.; T. A. Hendry, The Mead Corporation, New York; Hale Holden, Jr., Byron Weston Company, Dalton, Mass.; W. W. Langtry, District of Columbia Paper Mills, Inc., Washington, D. C.; C. B. Morgan, Eastern Coorporation, Bangor, Me.; E. A. Oberweiser, Fox River Paper Corporation, Appleton, Wis.; E. C. Reid, American Writing Paper Corporation, Holyoke, Mass.; A. C. Remley, Nekoosa-Edwards Paper Company, Port Edwards, Wis.; F. H. Savage, International Paper Company, New York; W. B. Zimmerman, The Maxwell Paper Company, Franklin, O., and John D. Zink, Strathmore Paper Company, West Springfield, Mass. Alternates: R. S. Madden, Valley Paper Company, Holyoke, Mass., and A. F. Story, Chillicothe Paper Company, Chillicothe, O.

Bristol Board Group

At a meeting of the Bristol Board Group of the Writing Paper Manufacturers Association held on February 19 at the Waldorf-Astoria Hotel, New York, Norman Harrower, of Linton Brothers & Co., Fitchburg, Mass., was re-elected chairman of the Group, and Kendall Wyman, of the Champion Paper and Fiber Company, was re-elected vice chairman. A governing committee also was elected, consisting of Messrs. Harrower and Wyman and J. E. Holmes, Chemical Paper Manufacturing Company; R. M. Sweney, Franklin Paper Company, and H. W. Tunstall, Wheelwright Papers, Inc.

United States Pulp Producers Association

The annual meeting of the United States Pulp Producers Association was held at the Waldorf-Astoria Hotel, New York, on January 19, at which five regional directors and six directors at large were elected to the Executive Board for the ensuing year.

The regional directors, all re-elected, are Amor Hollingsworth, of the Penobscot Chemical Fibre Company, representing New England; Norman W. Wilson, of the Hammermill Paper Company, Middle Atlantic; Stuart E. Kay, of the International Paper Company, South; Stuart B. Copeland, of the Northwest Paper Company, Lake States, and Robert B. Wolf, of the Pulp Division of the Weyerhaeuser Timber Company, West Coast.

Directors at large are Alexander Calder, Union Bag & Paper Corporation; Downing P. Brown, Brown Company; J. M. Conway, Hoberg Mills; U. M. Dickey, Soundview Pulp Company; Edward Bartsch, Rayonier, Inc., and Lawson Turcotte, Puget Sound Pulp & Timber Company.

Oliver M. Porter, of New York City, was again named executive director of the Association.

Forest Industries Council

Philip H. Glatfelter, president of the P. H. Glatfelter Company, Spring Grove, Pa., was elected general chairman of the Forest Industries Council at a meeting of the Council held in New York City on February 17. He will replace F. K. Weyerhaeuser, of the Weyerhaeuser Sales Company, St. Paul, Minn., whose term had expired. The office of chairman is held alternately by representatives of the lumber industry and the pulp and paper industry. Mr. Glatfelter is the first representative from the pulp and paper industry to hold the office.

The Forest Industries Council was organized to afford an effective vehicle for the co-ordination of forest policy and program in the wood consuming industries. Five members from the lumber industry, three from the Pulp and paper industry and two from the pulpwood industry currently constitute its membership. The secretaries of the National Lumber Manufacturers Association, the American Paper and Pulp Association and the American Pulpwood Association are *ex-officio* members. Pulp and paper representatives named to the Council for the new term are the following:

Members—P. H. Glatfelter, P. H. Glatfelter Company, Spring Grove, Pa.; C. H. Sage, Kimberly-Clark Corporation, Neenah, Wis.; Sydney Ferguson, The Mead Corporation, 230 Park Ave., New York, N. Y.

Alternates—S. B. Copeland, Northwest Paper Company, Cloquet, Minn.; Paul Koenig, P. H. Glatfelter Company, Spring Grove, Pa.; W. J. Damtoft, Champion Paper and Fibre Company, Canton, N. C.

Ex-officio—Earl W. Tinker, secretary, American Paper and Pulp Association, New York City.

Working committees of the Council include the Forest Industries Information Committee which promulgates information with respect to the forest products industries, the Committee on Timber Valuation and Taxation which was instrumental in securing important amendments in the 1944 Revenue Act, the Committee on Public Relations, and the Committee on General Forest Policy.

Progress reports were presented to the Council by these working committees at the February 17th meeting. A general forest policy statement approved by the Council has been referred back to the trade associations of the forest industries for concurrence before publication.

Cover Paper Group

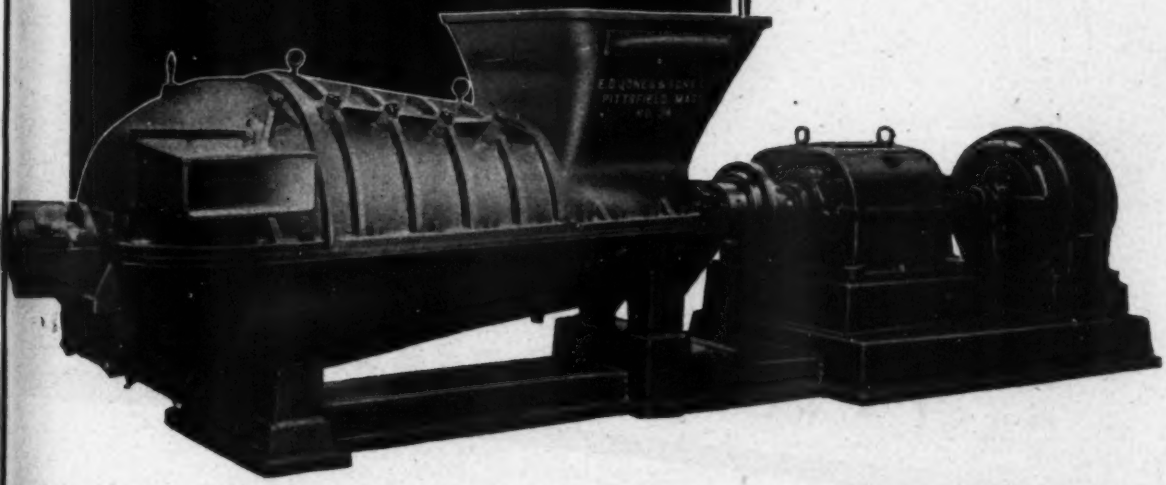
At the annual meeting of the Cover Paper Group at the Writing Paper Manufacturers Association held on February 21 at the Waldorf-Astoria Hotel, New York, W. W. Langtry, of the District of Columbia Paper Mills, Washington, D. C., was re-elected chairman of the group, together with a governing committee consisting of the following:

M. A. Park, of the Marvellum Company, vice chairman; G. H. Beckett, of The Beckett Paper Company; A. E. Frampton, of the Hammermill Paper Company, and R. H. Morrill, of the Chemical Paper Manufacturing Company.

THE JONES PULPER

For Quick, Complete, and Efficient Defiberizing at LOW COST

Completely defiberizes, with equal facility, hard sized rag or half rag papers; sheeted or lapped Sulphate, Sulphite, Soda or Mechanical Pulps, and can be regulated to obtain the desired results.



Jones

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E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.

Builders of Quality Machinery for Paper Mills

Sulphite Paper Manufacturers Association

E. W. Kiefer, of the Port Huron Sulphite & Paper Company, Port Huron, Mich., was re-elected general chairman of the Sulphite Paper Manufacturers Association at the annual meeting of that organization at the Waldorf-Astoria Hotel in New York on February 20. Fred W. Cole, of Fraser Industries, Inc., New York, was elected vice chairman for the Bleached Group; George Stuhr, of the International Paper Company, New York, vice chairman for the Unbleached Group; Rufus L. Sisson, Jr., of the Racquette River Paper Company, Potsdam, N. Y., vice chairman for the Manila Group, and Wayne A. Brown, of the Crown Zellerbach Corporation, New York, vice chairman for the Machine Glazed Group.

The foregoing officers and the following will comprise the Association's Board of Governors for 1945: Jack B. Coure, Hollingsworth & Whitney Company; Gilford F. Henderson, Brown Company; Neil E. Nash, Nekoosea-Edwards Paper Company; Fred P. Pandow, Consolidated Water Power and Paper Company; John Stevens, Jr., Marathon Corporation, and Rufus I. Worrell, The Mead Corporation.

Ground Wood Paper Manufacturers Association

At the annual meeting of the Ground Wood Paper Manufacturers Association held on February 20 at the Waldorf-Astoria Hotel, New York, the following officers and members of the Board of Governors were re-elected for the ensuing year:

President, Paul A. Mahony, International Paper Company; Vice Presidents, Fred W. Cole, of Fraser Industries, Inc., and George H. Fay, of the Mead Sales Company; Governors, James H. Coy, Flambeau Paper Company, and E. G. Murray, St. Regis Paper Company.

Glassine and Greaseproof Manufacturers Association

The Glassine and Greaseproof Manufacturers Association held its annual meeting on February 21 at the Waldorf-Astoria and re-elected Paul F. Moore, of the Westfield River Paper Company, chairman. Serving with Chairman Moore on the Executive Committee during 1945 will be Folke Becker, of the Rhinelander Paper Company; Paul E. Hodgdon, of the Deerfield Glassine Company; John L. Riegel, of the Riegel Paper Corporation; Arthur Schwab, of the Hamersley Manufacturing Company, and Thomas J. Burke, secretary-treasurer of the Association.

The Tissue Association, Inc.

Joel F. Hartman, of the Barclay Tissue Corporation, was elected president by The Tissue Association, Inc., at the annual meeting of that organization on February 19 at the Waldorf-Astoria Hotel, succeeding R. B. Stevens, of the Stevens & Thompson Paper Company. B. I. Reider, of the Victoria Paper Mills, was elected vice president, and B. F. Picola, of the Gotham Tissue Corporation, was elected treasurer.

The Board of Directors for 1945 consists of Wayne A. Brown, Crown Zellerbach Corporation; H. G. Wintgens, Hoberg Paper Mills, Inc.; E. E. Grant, Crystal Tissue Company; A. B. Hansen, Northern Paper Mills; Grafton Houston, Fort Howard Paper Company; J. H. Leo, Brown Company; John McEwan, Mohawk Valley Paper Mills; John McKirdy, Jr., Scott Paper Company; R. B. Stevens, Stevens & Thompson Paper Company, and R. W. Sweet, Sweet Bros. Paper Mfg. Company.

The Association also elected the following divisional chairmen: Joel F. Hartman, Barclay Tissue Corporation, Roll Toilet Tissue Division; C. E.

MISCO 'C'

The Corrosion Resistant Alloy

CAST • ROLLED • FABRICATED

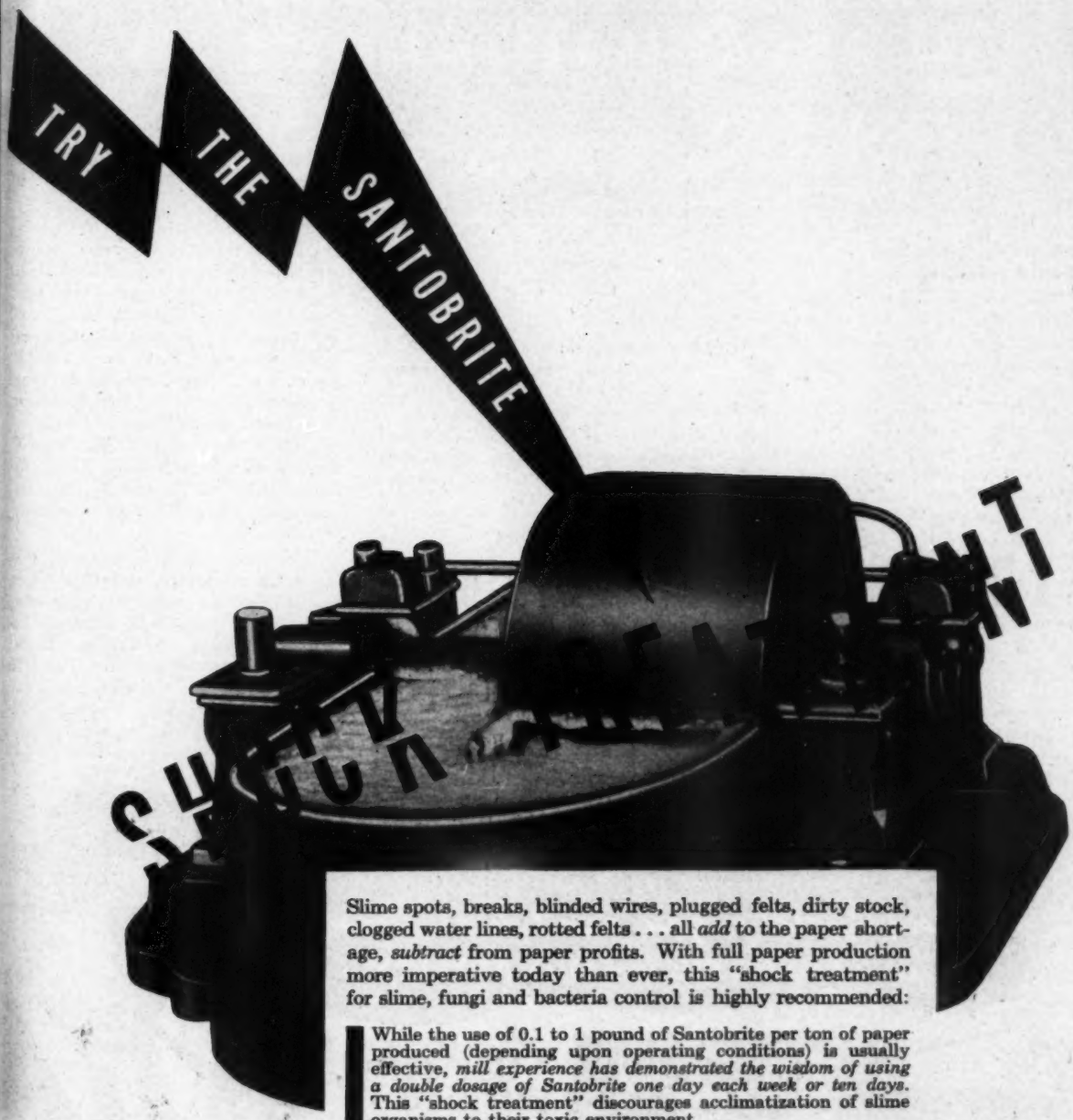
is best for

Digester Neck Rings • Blow-off Valves
Acid Valves • Digester Bottom Sleeves
Digester Heads • Bottom Crosses
Strainers • Fittings • Acid Pumps • Piping
and all other
equipment exposed to corrosion by sulphite acids

MICHIGAN STEEL CASTING COMPANY *1999 Guoin Street* **DETROIT 7, MICHIGAN**

MISCO
Heat and Corrosion Resistant Alloys

One of the World's Pioneer Producers of Chromium-Nickel Alloy Castings



Slime spots, breaks, blinded wires, plugged felts, dirty stock, clogged water lines, rotted felts . . . all *add* to the paper shortage, *subtract* from paper profits. With full paper production more imperative today than ever, this "shock treatment" for slime, fungi and bacteria control is highly recommended:

While the use of 0.1 to 1 pound of Santobrite per ton of paper produced (depending upon operating conditions) is usually effective, *mill experience has demonstrated the wisdom of using a double dosage of Santobrite one day each week or ten days.* This "shock treatment" discourages acclimatization of slime organisms to their toxic environment.

Santobrite is chemically stable, non-corrosive to metals, non-volatile, practically odorless, is easy to handle. When applied properly, it is safe to mill workers and users of the mill's products.

Latest information on the availability of Santobrite for use in your mill will be given on request. Also, Technical Bulletin O-5, "Santobrite for Micro-organism Control in the Pulp and Paper Industry" is yours for the asking. Address: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, St. Louis 4, Mo.

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CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

O'Connor, Jr., Berst-Forster-Dixfield Company, Paper Towel Division; W. C. White, Jr., Pequannock Valley Paper Company, Jumbo Roll Division; R. A. Marteith, Personal Products Corporation, Facial Tissue Division; John J. Cahill, Crystal Tissue Company, Wrapping Tissue Division, and James Suter, Rondout Paper Mills, Inc., No. 2 Wrapping Tissue Division.

Specialty Paper and Board Affiliates

The Specialty Paper and Board Affiliates, meeting at the Waldorf-Astoria Hotel on February 21, elected S. B. Sutphin, of the Beveridge Paper Company, Indianapolis, Ind., president, and W. B. Sheehan, of the Missisquoi Corporation, Sheldon Springs, Vt., vice president. The new Executive Committee consists of President Sutphin and Vice President Sheehan and the following:

H. S. Lewis, J. P. Lewis Company; P. R. Bachman, Riegel Paper Corporation; Kendall Wyman, Champion Paper & Fibre Company; T. Stewart Foster, Foster Paper Company, Inc., G. E. O'Connor, Mohawk Paper Mills, Inc.; Frank C. Ash, Oswego Falls Corporation; W. S. Gamble, Brownville Board Company; H. C. Johnson, Sorg Paper Company; A. K. Nicholson, Hollingsworth & Vose Company; Jack B. Cowie, Hollingsworth & Whitney Company; Malcolm B. Lowe, Lowe Paper Company; Maurice A. Park, Marvellum Company; F. Henry Savage, International Paper Company, and J. N. Logan, Newton Paper Company.

Newsprint Manufacturers Association

Harold S. Smith, of the Maine Seaboard Paper Company, was re-elected president of the Newsprint Manufacturers Association of the United States, Inc., at the annual meeting of that organization at the Waldorf-Astoria Hotel, New York, on February 21. John L. Hobson, of the St. Croix Paper Company, and J. D. Zellerbach, of the Crown Zellerbach Corporation, were elected vice presidents. Dr. E. O. Merchant continues as secretary.

Association of Pulp Consumers, Inc.

Walker Hamilton, vice president of the Riegel Paper Corporation, New York City, was elected president of the Association of Pulp Consumers, Inc., at a directors meeting which was convened immediately following the "wartime" annual meeting of the Association held Tuesday, February 20, at the Waldorf-Astoria Hotel, New York.

Thomas E. Morriss, vice president of the Central Fibre Products Company, Chicago, Ill., was chosen vice president of the Association, and C. V. Maudlin was re-elected secretary-treasurer. The offices of the Association are in the Mills Building, Washington, D. C.

At the abbreviated annual meeting of the members held earlier in the day, the following were elected as directors: C. M. Forman, Ohio Boxboard Company, Rittman, O.; Arnold B. Huyssoon, Continental Paper Company, Ridgefield Park, N. J.; E. R. Leonhard, Paterson Parchment Paper Company, Bristol, Pa.; Paul F. Moore, Westfield River Paper Company, Russell, Mass.; Robert B. Stevens, Stevens & Thompson Paper Company, Greenwich, N. Y., and W. B. Zimmerman, Maxwell Paper Company, Franklin, O.

The foregoing directors will serve with the following directors whose terms continue through the coming fiscal year: Maxwell D. Bardeen, Lee Paper Company, Vicksburg, Mich.; F. E. Brown, Manchester Paper & Board Company, Richmond, Va.; George K. Ferguson, Watervliet Paper Company, Watervliet, Mich.;

You Paper Mill Men • take a Tip on Kalamazoo Tile Stock Tanks and Chests • you can't beat them for STRENGTH and DURABILITY •

Kalamazoo Vitrified Glazed Tile is a "Natural" for Paper Mill needs

Smooth, hard, strong, easily cleaned and highly resistant to chemical action, this marvelous vitrified glazed tile type of construction is preferred by scores of leading paper mill executives and engineers. Adaptable for stock tanks and chests of all kinds. Costs no more than concrete tanks that require constant maintenance expense. . . . An exclusive method of glazed tile tank construction developed by Kalamazoo engineers. It provides greater flexibility and lower cost for all paper mill stock handling problems. Immediately available.

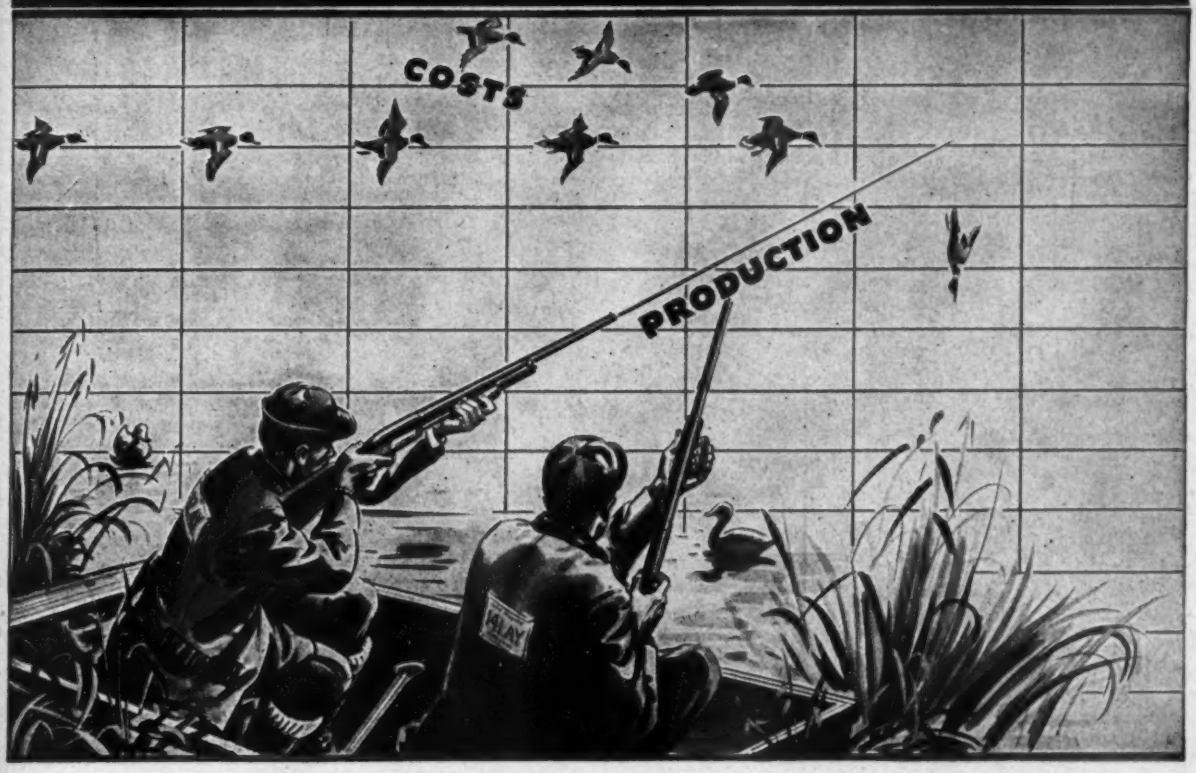
• Any Size or Shape Desired—

Wide, narrow—shallow or deep. Round, rectangular or square. Half-round or tapered bottom and corners. Mid-feathers and fins where needed to control stock flow. Adaptable to pumps or agitators. Construction individually designed to meet space, tonnage or production requirements.

Ask for engineering data.

Kalamazoo TANK & SILO CO
KALAMAZOO - MICHIGAN

As Production Goes UP
—Costs come DOWN



From the moment when the furnish flows over the fourdrinier wires the process of manufacturing paper consists essentially of a series of operations for removing the water from the fibers. At the wires this is done by suction; at the couch and felt, by pressure; at the drier rolls, by evaporation. Suction and pressure are fast and relatively inexpensive. Evaporation, slow and costly. Equip your paper machines with Hamilton Felts and speed up! When the sheets leave Hamilton Felts they contain so little water to be evaporated that less heat is needed at the driers. Formation is better, stronger, with corresponding reduction in broke. Production rises and costs come down.

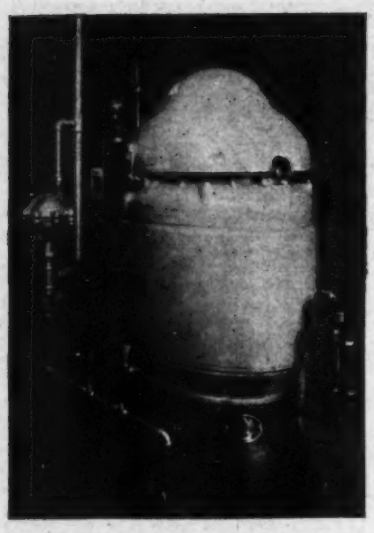
« « From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost. » »

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Miami Woolen Mills

Hamilton Felts

Established 1858



VERY NEAT---

But Also Highly Efficient

The men who build Layne Well Water Systems like to turn out a neat job of pump, motor and control installation. But it is the engineers in the factory who are responsible for their extra high over-all efficiency. First, they considered all of the well conditions—diameter, depth, static water level, capacity, drawdown and total head. Then the size and stages of the pumps, proper diameter and length of column pipe and line shaft and thus determined the right horsepower to deliver the required amount of water into the user's system.

These same engineers created the pump design, specified the kind and size of bearings and saw that all parts were precision built of the finest quality materials. The result is a highly efficient, complete water system that will pay extra dividends in long life, low operation cost and freedom from mechanical faults.

Layne installed wells and Layne vertical turbine pumps are fully recognized by the most eminent engineers as being the finest in quality and the most efficient ever built.

If you need more, either from additional wells, or from reconditioned old wells, write for further details. Address LAYNE & BOWLER, INC., General Offices Memphis 8, Tenn.

LAYNE PUMPS *— fulfill every need for producing large quantities of water at low cost from wells, streams, mines or reservoirs. Send for literature.*

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Western Co. of Minnesota, Minneapolis, Minn. * International Water Supply Ltd., London, Ontario, Canada

LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

Walker Hamilton, Riegel Paper Corporation, New York City; L. J. Long, The Crystal Tissue Company, Middletown, O.; Thomas E. Morriss, Central Fibre Products Company, Chicago, Ill.; George F. Moxley, West Jersey Paper Mfg. Company, Camden, N. J.; William M. E. Roberts, Fox River Paper Corporation, Appleton, Wis., and Austin P. Story, The Chillicothe Paper Company, Chillicothe, O.

In his report to the members, Dwight L. Stocker, the retiring president, stressed the important part played by the consumers of purchased pulp in producing paper and paperboard for use in the war effort and for essential civilian needs. Mr. Stocker pointed out that the large amount of waste paper and rag processing equipment operated by the members had enabled them to "stretch" the limited amount of market wood pulp available to them and as a result, they have been able to produce greatly increased quantities of paper and paperboard for military and essential civilian needs.

Secretary Maudlin told the members that the Association now represents 282 mills producing paper and paperboard and that a recent check indicated that there were only 51 firms dependent on purchased wood pulp which are not members.

A majority of the members were represented at the meeting by proxies, since in accordance with the request of Director of War Mobilization Byrnes that the attendance at meetings be held to an absolute minimum, the Association had urged that members who did not plan to be in New York on other business on the day of the meeting vote by proxy.

Coated and Processed Paper Association

James T. Cronk, of the Hampden Glazed Paper and Card Company, Holyoke, Mass., was elected president of the Coated and Processed Paper Association at the annual meeting held at the Hotel Commodore, New York, on February 19, succeeding John N. Hazen, of the Hazen Paper Company, Holyoke, Mass., who had served two years as the Association president.

William B. Snow, of the Middlesex Products Corporation, Cambridge, Mass., was elected vice president representing the Manufacturing Division, and Ralph H. Lane, of Bradner Smith & Co., Chicago, Ill., was re-elected vice president representing the Merchandising Division. Charles Matthais, of the Matthias Paper Corporation, New York City, was elected a merchandising member of the Executive Committee, and Sam R. Fry, of the Wyomissing Glazed Paper Company, Reading, Pa., a manufacturing member of the Committee, each for the term expiring in February, 1947. The other members of the Executive Committee, whose terms expire in February, 1946, are Harry B. Conklin, of Louis Dejonge & Co., New York City, a manufacturing member, and George J. E. Buell, of Charles W. Williams & Co., New York City, a merchandising member.

Arthur A. Thomas, executive director of the Association, was re-elected treasurer.

Blotting Paper Manufacturers Association

Joseph J. Hallowell, of the Wrenn Paper Company, Middletown, O., was elected president of the Blotting Paper Manufacturers Association at the annual meeting of that organization in the Waldorf-Astoria Hotel on February 19. Mr. Hallowell succeeds Graham A. Carlton, of the Standard Paper Mfg. Company, Richmond, Va. L. D. Nicholson, of the District of Columbia Paper Mills, Inc., Washington, D. C., was elected vice-president, succeeding Mr. Hallowell. James L. Ritchie, of New York, was named secretary and treasurer.

Paper Makers' Advertising Association

Officers were re-elected for another year at the thirtieth annual meeting of the Paper Makers' Advertising Association held February 19 at the Hotel Lexington in New York. Hubert S. Foster, of the Mead Corporation, was re-elected president; Richard A. Faulkner, of the International Paper Company, eastern vice president; Frank L. Blake, of the Kimberly-Clark Corporation, western vice president; Floyd L. Triggs, of the Riegel Paper Corporation, treasurer, and Bradley E. Stafford, of the Strathmore Paper Company, secretary.

President Foster was unable to attend because of illness and the meeting was presided over by Vice President Faulkner.

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▶▶▶ SPECIAL CERTIFICATES will be awarded to its 360 founding member companies by the National Association of Manufacturers, according to an announcement by William P. Witherow, president of Blaw-Knox Company, Pittsburgh, and NAM golden anniversary chairman. These awards are for outstanding contributions to American industrial progress, and will be presented with special ceremonies during the year.

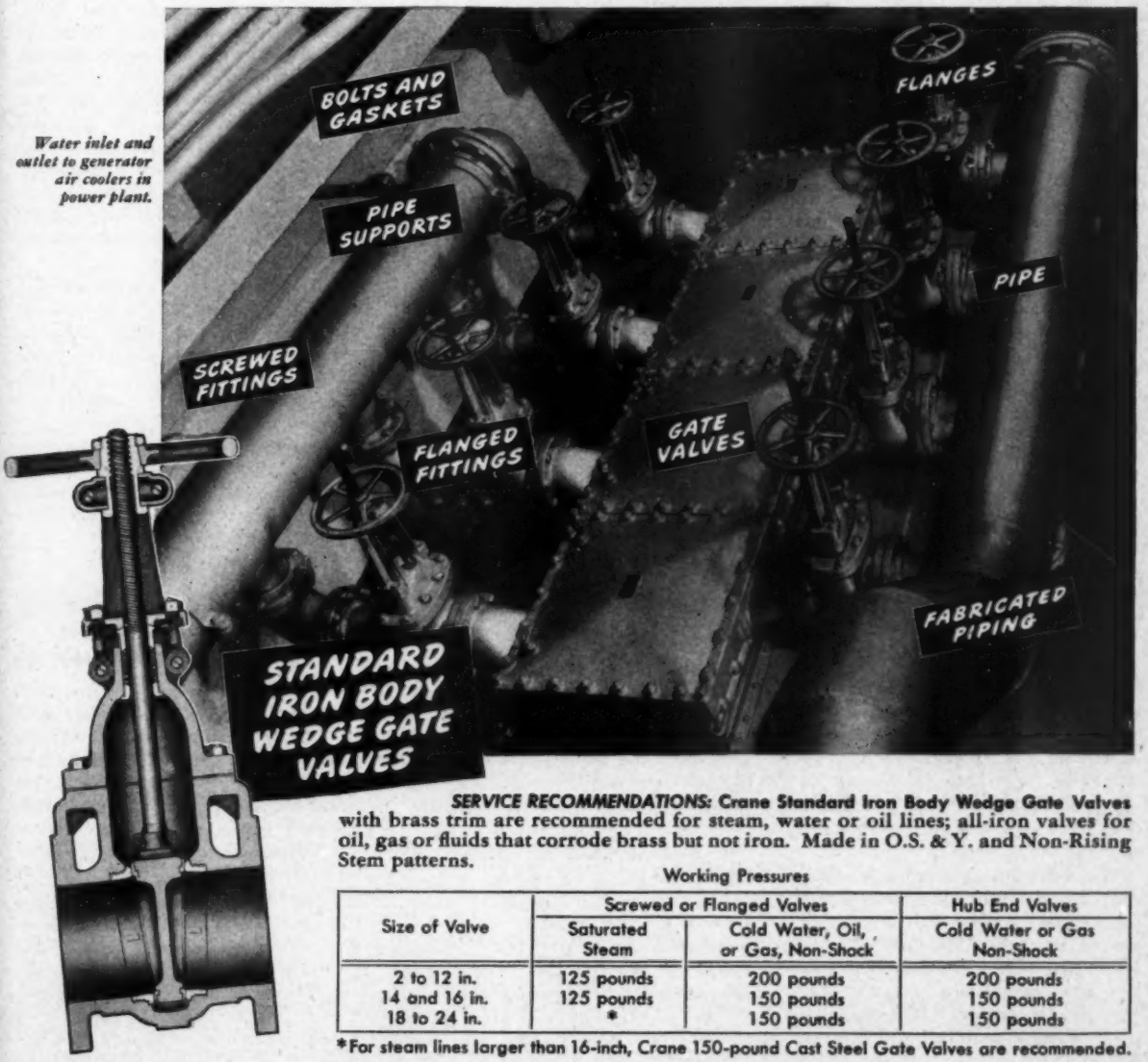
What's Your Piping Materials Problem?
...CRANE Has the Answers!

ONE SOURCE OF SUPPLY

ONE RESPONSIBILITY FOR ALL PARTS

ONE STANDARD OF QUALITY

No matter what your need in piping materials... your Crane Branch or Wholesaler can meet it. One order covers all requirements at any time. You choose from the world's greatest line of piping materials—in brass, iron and steel. You help assure the best piping installation because all parts are of uniformly high quality—backed by a single responsibility. Not only do you simplify and speed deferred replacement work by using Crane *complete* piping materials service—but you get full benefit of Crane Co.'s 90-year experience in the piping equipment field.



Water inlet and outlet to generator air coolers in power plant.

SERVICE RECOMMENDATIONS: **Crane Standard Iron Body Wedge Gate Valves with brass trim are recommended for steam, water or oil lines; all-iron valves for oil, gas or fluids that corrode brass but not iron. Made in O.S. & Y. and Non-Rising Stem patterns.**

Working Pressures

Size of Valve	Screwed or Flanged Valves		Hub End Valves
	Saturated Steam	Cold Water, Oil, or Gas, Non-Shock	Cold Water or Gas Non-Shock
2 to 12 in.	125 pounds	200 pounds	200 pounds
14 and 16 in.	125 pounds	150 pounds	150 pounds
18 to 24 in.	*	150 pounds	150 pounds

*For steam lines larger than 16-inch, Crane 150-pound Cast Steel Gate Valves are recommended.

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CRANE VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

1944 Review of the Kraft Industry

WILLARD J. DIXON, President
Kraft Paper Association, Inc.

▶▶▶ FOR THE LAST TWO YEARS the kraft paper manufacturing industry has maintained a relatively stable though depressed level of operation. Production in 1944 showed an increase of only 1 per cent over 1943 with the industry operating at approximately 75 per cent of its capacity.

A year ago it was our forecast that 1944 production would exceed that of 1943 by at least 100,000 tons. The industry fell short of that forecast through no fault of its own. The Pulp Allocation Office of the WPB which controls the production of kraft paper just as it controls the production of all paper and paperboards selected the self-contained kraft paper mills as the major source of additional pulp to meet the expanding needs of the kraft board manufacturers. A major portion too of the kraft pulp needed by the F.E.A. for export came from paper rather than board mills. These inroads into the industry's pulp supplies made our 1944 production estimate unattainable.

The Pulp Allocation Office not only caused shifts of production between this industry and others but also caused shifts within the industry itself. As in the previous year, wrapping paper and grocery and variety bag papers were restricted in volume while multiwall sack paper and such other converting papers as asphalting, creping, gumming, laminating, ordnance wrap, twisting and water repellent papers continued to expand in volume.

Civilian supplies of kraft paper becoming short in 1943, began actually to disappear as 1944 drew to a close. Housewives and shoppers were asked to do without grocery bags and Christmas packaging. Shortages of civilian packaging materials threaten to become even more acute during the first half of 1945.

The OPA maintained its complete control of prices on all grades of kraft paper during 1944. This was accomplished through MPR No. 129 and MPR No. 182. The former regulation was completely revised during the year, becoming RMPR No. 129 in June. The only change made by RMPR No. 129, affecting this industry, was in respect to the formula for pricing new grades of paper. An important amendment to MPR No. 182 was issued in January 1944 by which the OPA, upon the recommendation of the industry advisory committee, raised the base weight on wrapping paper from 30 lb. to 40 lb. This enabled the industry to recover a portion of its higher costs on wrapping paper lighter than 40 lb. and made a greater quantity of these lighter weight papers available to the industry's customers at a saving in fiber.

It is seldom easy to forecast an industry's prospects a year in advance. With the uncertainties created by the war such forecasting is triply difficult; to guess when the war itself will end, to estimate the time needed to re-establish labor and raw material supplies and to forecast the postwar demands for the industry's products.

Victory in Europe now appears a matter of weeks, or at most of months rather than years. Upon the ending of the European war, we may anticipate an increase in wood-cutting operations which in the south and the Pacific northwest would immediately be reflected in increased paper production. The paper industry, under such conditions would undoubtedly be relieved of some of the pressure for deliveries of pulp to the board industry. Certainly pressures originating from the export demand upon F.E.A. for pulp shipments to the Continent would be relieved by the supplies known to exist in Sweden. Demand for nitrating pulp required for conversion into smokeless powder would be lessened considerably by Germany's defeat. Although nitrating pulp is derived from a sulphite or bleached sulphate pulp base, it detracts in the latter case from the potential supply of unbleached sulphate pulp. A lesser demand for pulp for nitrating would undoubtedly add to the supplies of unbleached kraft pulp.

It is not difficult to forecast that under conditions of either war or peace, demand will exceed the industry's productive capacity. War requirements in 1945 have already forced the WPB to make two drastic changes in its first quarter pulp allocations. On January 20 it instructed all converter mills to use 5 per cent less market pulp than had been allocated to them. On February 1 it ordered all manufacturers of grocery bag paper to reduce their consumption of pulp for production of that paper by 10 per cent. These changes increased the demand pressure. Were Germany to surrender tomorrow, at least 150,000 tons of kraft paper would be needed just to replenish the depleted stocks at the mills and the normal inventories of merchants, converters and retail stores.

We know that today's demand for kraft paper under war conditions is in excess of our ability to supply it in full. We also estimate that there is a pent-up demand for kraft paper for civilian consumers that would also exceed supply. Consequently, in either case the demand outlook for 1945 is of capacity proportions.

Despite difficulties due to shortages of fuel, lack of truck tires, breakdowns in transportation and shortages of truck and repair parts, the real problem in the paper industry centers around manpower shortages. These manpower shortages are primarily in the woods. If adequate manpower can be obtained either through improved domestic labor supply or through increased use of prisoners of war, the production of kraft paper could return to near-capacity operations very quickly.

In summary, it is our belief that whereas the present low rate of operations will continue while Germany remains in the war, recovery could take place very rapidly thereafter. The WPB, however, would probably not be ready to release the industry's pulp entirely for its own use. Our best estimate, therefore, for 1945 production of unbleached kraft paper would be an amount equal to or only slightly higher than the 1944 level.

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KRAFT PAPER ASSOCIATION RE-ELECTS OFFICERS

At the annual meeting of the Kraft Paper Association, Inc., held February 21, 1945, at the Waldorf-Astoria Hotel, in New York City, Willard J. Dixon, of the St. Regis Paper Company, and George Stuhr, of the International Paper Company, were re-elected president and vice president, respectively.

Also re-elected to the Excutive Committee of the Association were: W. H. Anders, Nashua River Paper Company; O. P. Carter, Gaylord Container Corporation; H. S. Daniels, Union Bag & Paper Corporation; J. R. Diggs, Mosinee Paper Mills Company; K. O. Elderkin, Crossett Paper Mills; R. L. Pitts, Southern Advance Bag & Paper Company; G. F. Henderson, Brown Company; R. A. McDonald, Crown Zellerbach Corporation; S. M. Phelan, Jr., West Virginia Pulp & Paper Company; C. W. Smith, Central Paper Company.

ONE OF 27 DOW CHEMICALS USED BY THE PAPER INDUSTRY

a tip from cosmetics

for men using pigment binders, and film forming agents

Need a pigment binder in your product? Or a film forming agent? Then it may profit you to eavesdrop on an experience of the cosmetic industry. When silk stockings became an early war casualty, ladies demanded leg make-up preparations. But specifications laid down by the feminine sex were pretty tough—leg make-up must stay on and not wear off in spots, must be free of odor, harmless to the skin, uniform and stable in color, sufficiently viscous to prevent running before drying, be unaffected by perspiration—truly an imposing list of requirements.

Cosmetic executives consulted with Dow research technicians and numerous experiments followed. The final answer was Methocel. Why? Because this water soluble Dow cellulose ether, an excellent pigment binder, holds the color fast to the leg. It also acts as a film forming agent on the skin producing proper luster and opacity. It is odorless, viscous, harmless to skin, exceptionally uniform, reduces pigment settling in the bottle—all in all a perfect solution for a perplexing problem.

The same sterling qualities of Methocel may help improve your product. We'll be glad to send more information.

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Methocel

Water Soluble Dow Methylcellulose

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

Re-orders Manganese Steel Barking Drum Chain *After 15 Years Experience* . . . . . .

From the sulphite superintendent of a wood pulp paper company came this letter:

"We plan to install a new 12' x 45' barking drum in our sulphite wood room.

"We have used your 6" pitch barking drum chain for the past fifteen years and inasmuch as it has given us very good service, we are inclined to favor your chain for our new drum.

"The new drum will require 520 feet of chain, to be made up of 10 strands 52 feet long, with an offset link for each strand. Please quote us your price."

Two months later, the order for the new Amsco manganese steel barking drum chain was shipped.

To speak highly of a product when asking for a quotation attests confidence in the purveyor as well as the product. The customer, of course, was not asserting that a single Amsco chain lasted fifteen years, as he had reordered strands during that period; but rather, that he had used Amsco chain that long and found it more durable and economical than other chains.

C-486. Amsco barking drum chain.

The toughness and work-hardening property of austenitic manganese steel that has given Amsco barking drum chain its high resistance to breakage and wear are equally effective in other applications in wood pulp mills. Manganese steel conveyor chain has also proved most economical for many pulp and paper mills. Various types of chain and other manganese steel pulp mill equipment is shown in Bulletin 144-L, sent on request.

C-483. Part of 1,300 feet of No. 111 chain for transfer tables in a pulp mill.

How Amsco-Nagle Pumps ably handle abrasive, corrosive or heavily loaded liquids told in Bulletin 940.

Amsco

AMERICAN MANGANESE STEEL DIVISION

Chicago Heights, Illinois

AMERICAN Brake Shoe COMPANY

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

SUPPLY DEALERS DINNER

Numerous executives of paper, paperboard and roofing mills were guests at the thirty-seventh annual dinner of the New York Association of Dealers in Paper Mills' Supplies, Inc., in the grand ballroom of the Hotel Commodore, New York, on the evening of Tuesday, February 20. All previous records of attendance were exceeded at the dinner, more than 600 being present, including approximately 80 wounded convalescent soldiers, sailors and marines recruited from the Brooklyn Naval Hospital, the Naval Hospital at St. Albans, L. I., and Halloran Army Hospital on Staten Island, for whom dinner tickets were provided by various firm members of the New York Association.

Following an excellent seven-course wartime meatless repast, an entertaining stage show of a dozen acts kept the assemblage in high spirits for upwards of two hours. The talented artists from the theatre, radio and night clubs performed on a stage at one side of the spacious dining room, thus affording everyone an unobstructed view.

Once again that perennial duo of Walter H. Martens, of George W. Millar & Co., Inc., New York, chairman of the Association's Dinner Committee, and Alfred J. Moran, of A. J. Moran & Co., Inc., Brooklyn, chairman of the Journal Committee, were chiefly responsible for the arrangements for the annual dinner and the souvenir journal which served as a menu, program and keepsake of the event. Assisting Mr. Martens on the Dinner Committee were Arthur Rosenfeld and John L. Nielsen. Ably aiding Mr. Moran in the production of the souvenir journal were Joseph V. Carrano, Anthony S. Gaccione, James Derrico, Joseph P. Gaccione, David Lipman, Joseph Maggese, Bert Lorenz, Miss Shirley Rief, Charles Passannante and Felix J. Trojana.

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COMING EVENTS

STATED MEETINGS

Technical Associations of the Pulp and Paper Industry

Delaware Valley Section—First Friday of each month at the Engineers' Club, Philadelphia, Pa.

Kalamazoo Valley Section—First Thursday of each month, including June, at 6:30 P. M. at the Columbia Hotel, Kalamazoo, Mich.

Lake States Section—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Chicago Professional Paper Group

Third Monday of each month at Chicago Bar Association, Chicago.

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***from* GASES**

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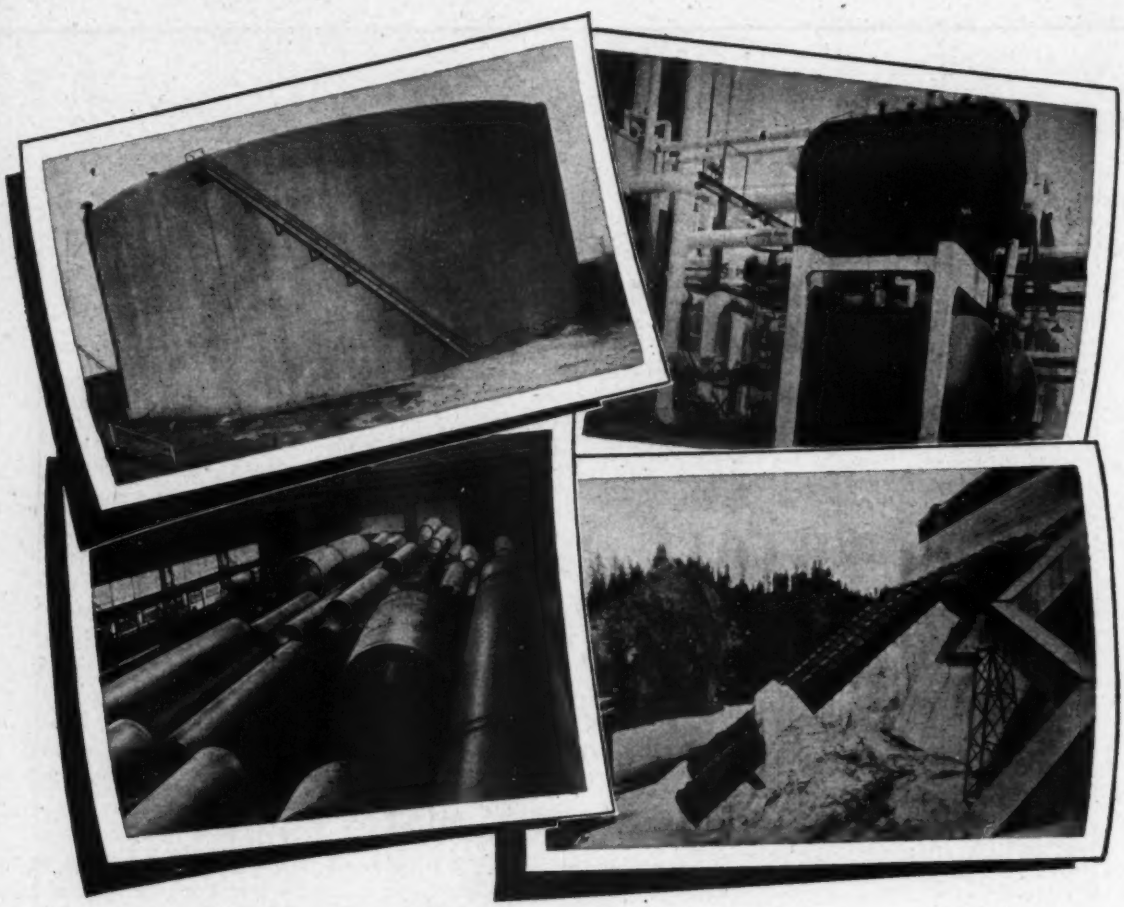

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General American is a *big* company. It has wide experience, gained in the successful handling of many very large and important projects. It also has *complete* manufacturing facilities, including X-ray, heat-treating and stress-relieving furnaces, and a thoroughly-equipped organization for field erection either in this country or abroad.

General American, through its Plate & Welding Division, has for years specialized in the manufacture of a long line of products for the iron and steel industry, such as those listed in the next column.

The tougher your job, the better General American will like it—because that's where skill and resourcefulness will be most appreciated. *Write* for any specific information you may need.

- Accumulators
- Pressure Vessels
- Pickling Tanks
- Tin Pots
- Stacks
- Acid Tanks
- Bins
- Towers
- Gas Mains
- Welded Pipe, large dia.
- Annealing Covers
- Galvanizing Pots
- Standpipes
- Oil Storage Tanks
- Coke and Benzol Plant Eqpt.
- Welded or riveted plate fabrication, shop built-up or field-erected

GENERAL AMERICAN
TRANSPORTATION CORPORATION

PLATE & WELDING DIVISION
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If you are in the market for accumulators, agitators, autoclaves, air receivers, bins, car tanks, boiler drums, condensers, columns, digesters, heat exchangers, dryers, filters, mixing and blending tanks, fractionating towers, stacks, storage tanks of all sizes for water, oil, molasses, alcohol, gasoline and other products; stills, scrubbers, large diameter welded or riveted pipe, refinery equipment including all types of pressure vessels, and general plate fabrication—General American's Plate & Welding Division, at Sharon, Pa., offers you many advantages. It is equipped to manufacture virtually anything made of carbon, stainless and alloy steels, Everdur, aluminum and other special alloys—either welded or riveted. It offers complete X-ray facilities, heat-treating and stress-relieving furnaces—is in position to build and test all classes of welded vessels to API-ASME, ASME and other codes. It maintains a large field erection department for either foreign or domestic work. It has a long record of success in producing specialized and difficult equipment for many industries.

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General American has unusually large manufacturing facilities—a staff of internationally-recognized engineers and scientists—research and development laboratories at both Sharon and Louisville. This combination of facilities is, we believe, unmatched elsewhere in America. We invite you to call on us for any sort of information you may need to judge our ability to help you. *Address:*

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ALLIED

WESTINGHOUSE CHANGES NAMES OF 2 DIVISIONS

Westinghouse has announced official changes in names of two divisions. It is believed these changes better describe the company's expanding functions, now and postwar.

Involved in the changes are the former Radio Division, which now becomes the Industrial Electronics Division, and the former Radio Receiver Division, which becomes the Home Radio Division. Each will continue under its present direction. C. J. Burnside, for the past three years manager of the Radio Division, will head the Industrial Electronics; and Harold B. Donley, named manager of the Radio Receiver Division at its organization last year, will head the Home Radio unit. The Home Radio Division has been moved from temporary quarters in Baltimore to a permanent location in Sunbury, Pennsylvania.

◆

PICK LOCATION FOR A NEW CALCO DIV. PLANT

A site has been chosen by the American Cyanamid Company for the Calco Chemical Division's new factory which will be used for the development of new products whose basic raw materials are available in the Ohio Valley trade center. The site acquired consists of 800 acres of land, 16 miles northeast of Parkersburg, 75 miles north of Charleston, and 12 miles from Marietta, Ohio.

Because of wartime restrictions on building, Calco management is not yet in a position to determine when building will be started on the new site.

◆

FARREL-BIRMINGHAM CO. BUYS ATWOOD MACHINE CO.

Farrel-Birmingham Company, Inc., Ansonia, Connecticut, and Buffalo, New York, has announced the purchase of The Atwood Machine Company of Stonington, Connecticut.

This transaction unites two old and well-known companies, and brings together nearly two centuries of experience in machine design and construction. Farrel-Birmingham was founded in 1836, while The Atwood Machine Company was founded in 1852. The Atwood company is a pioneer manufacturer of textile machinery. Farrel-Birmingham Company is well known as a manufacturer of industrial machinery and equipment.

Franklin R. Hoadley, who has been president and treasurer of The Atwood Machine Company for the past eight years, will succeed John W. Haddock as president of Farrel-Birmingham Company (See Personals).

◆

▶▶▶ THE REOPENING of its Los Angeles office the first of the year has been announced by the Chicago Bridge & Iron Company, Chicago. The office address in Los Angeles remains the same, Room 1105, William Fox Building. Dean E. Stephen, for several years assistant to the manager of the company's Washington, D. C., office, is in charge at Los Angeles.

◆

TWO NEW PROJECTS ARE PLANNED BY GOODRICH

New projects being planned by The B. F. Goodrich Company, Akron, Ohio, include a new research laboratory and an experimental war chemicals plant, according to a recent announcement.

The new laboratory will be constructed in Brecksville, Ohio, just 20 miles from the company's Akron plant. Plans have been completed and construction work will start as soon as possible.

The company has taken an option on land near Avon Lake, Ohio, as a probable site from the experimental war chemicals plant, which will be started as soon as government approval of the project has been obtained.

◆

▶▶▶ THE AWARD OF the Army Air Forces Air Technical Service Command for meritorious industrial achievement has been granted The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc. This recognition of its record adds to the honors awarded the company for its efforts on the production front, including the Army-Navy "E' flag, which has been renewed twice.

◆

STEIN, HALL MERGER

Conducted substantially under the same management for many years, Stein, Hall & Company, Inc., New York, and its wholly-owned subsidiary, Stein, Hall Manufacturing Company, Chicago, are now being operated as a single company under the name of the former.

The home office continues at 285 Madison Avenue, New York City, and the Chicago office and factory continue at 2841 South Ashland Avenue. To provide New York office space for reorganized and expanded industrial selling and product supply departments, the New York laboratory will be moved to Stein-Davies Company, Long Island City, New York, the company's gum and adhesive factory, where it is planned to centralize the company's laboratories.

In addition to the present production control and food laboratories, there will be adhesive, paper, textile, and starch laboratories. Service laboratories will continue to be maintained at Chicago on food, adhesive, and production control, and at Providence, Rhode Island and Charlotte, North Carolina, on textiles.

ARMY - NAVY "E" AWARDS

Alton Box Board Company, Alton, Illinois—For excellence in war production, this company was awarded the Army-Navy "E" pennant. The presentation was marked by special ceremonies at the Alton plant on the afternoon of Friday, March 16.

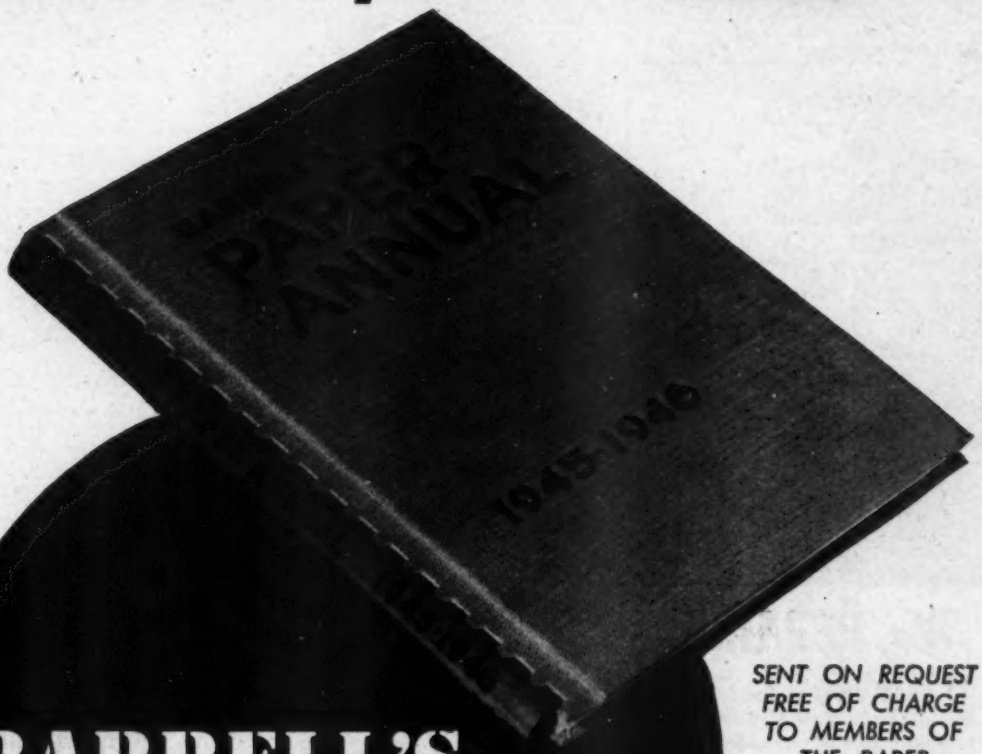
Hollingsworth & Whitney Company (Chickasaw Mills) Mobile, Alabama —With colorful ceremonies, this company became the first kraft mill to receive the Army-Navy "E" award. The presentation was made on February 16 by Major Roy D. Hickman, chief of the Birmingham (Ala.) Ordnance Division. Acting for his father, James L. Madden, son of the president of the company, received the coveted award for excellence.

Clark Equipment Company, Buchannan, Michigan—More than 5,000 employees and friends attended the presentation ceremonies when this company was awarded the Army-Navy "E" pennant on January 31. Major Nelson W. McCormick, chief of the Security Division, Detroit Ordnance District, made the award, which was accepted by the company president, A. S. Bonner.

Second Star: The Peerless Pump Division of Food Machinery Corporation, Los Angeles, California, has been awarded its second "E" star for continued excellence in its war production.

Fourth Star: For continued high achievement in the production of war materiel, The Ohio Injector Company, Wadsworth, Ohio, has just been awarded its fourth star.

Reserve yours NOW!



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1945 - 1946

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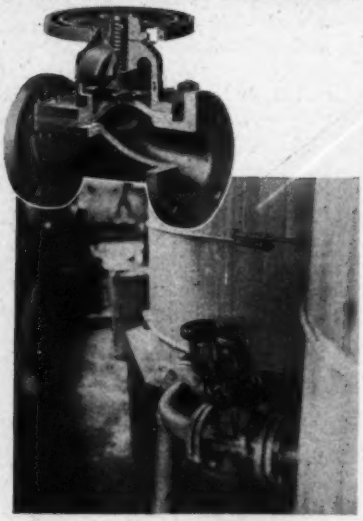
four years on Alum Lines



No REPAIRS!

"WE HAVE had no trouble whatever with the Hills-McCanna diaphragm valves on our alum system lines," a paper manufacturer writes. "After four years of continuous use the original valves and diaphragms are still giving us excellent service."

The leakproof quality of Hills-McCanna valves is due to a resilient, long-life diaphragm that seats tightly on the weir even when foreign particles are present and isolates working parts from flow. Trouble-free service is further assured because there is a minimum restriction of flow, no wire drawing to worry about and no packing to replace.

For stock lines, black liquor, alum, air, water, bleach lines, etc. Pressures to 150 P.S.I. Sizes ½" to 14". Screwed or flanged connections.

Send for a copy of catalog V-44 which illustrates and explains Hills-McCanna Diaphragm Valves.

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SAUNDERS PATENT
Diaphragm VALVES

Proportioning Pumps—Force-Feed Lubricators —Chemical Valves—Air & Water Valves— Marine Valves—Magnesium Alloy Castings

SAFETY

SAFETY SCORES

▶▶▶ PERFECT SCORES are recorded for thirteen mills at the close of January, the fifth month in the 1944-45 Paper Industry Safety Contest. The following list of mills have a perfect record:

Division I—Pulp and Paper Mills

Groups A and B (None)

Group C

*Container Corp. of America, Carthage, Ind.

Group D

Marathon Corp. (Ashland Div.).
Strathmore Paper Co. (Woronoco Mill No. 1), West Springfield, Mass.
Certain-teed Products Corp., Buffalo.
*Central Fiber Products Co., Denver.
E. I. du Pont de Nemours & Co., Newhall, Wilmington, Del.

Division II—Paper and Board Remanufacturing

The Flintkote Co., Chicago Heights Plant, Ill.
Ft. Wayne Corr. Paper Co., Chicago.
Bird & Son, Inc. (Roofing Plant), Shreveport, La.
Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.
Kimberly-Clark Corp. (Atlas Mill), Appleton, Wis.
Iowa Fibre Box Co., Keokuk, Iowa.
Bay West Paper Co., Green Bay, Wis.

(*) January report missing.

◆

"SAFEST MILL IN CANADA" TROPHY AWARDED TO PRICE BROS. RIVERBEND MILL

In the final figures for the "Safest Mill in Canada" contest for 1944 the Riverbend Mill of Price Bros. and Company not only won the Class A trophy with a perfect score, but had no accidents for fourteen months. The Class B Trophy was again won by the Lotbinière Pulp and Paper Company, with only one accident in 1944. Presentation of the Class A award to Dr. Joseph Edwards, general superintendent of the Riverbend mill was a feature of the Technical Section annual luncheon. In making the presentation, J. N. Stephenson, editor of the *Pulp and Paper Magazine*, which sponsors the contest, related how the mills of Price Bros. have steadily improved their standing from trailers to leaders.

◆

DEPT. OF LABOR SHOWS DOWNWARD FREQUENCY TREND IN SAFETY DRIVE

The co-operative safety drive sponsored by the U. S. Department of Labor has brought satisfactory results, according to accident frequency

We offer safe, economical solutions to all pulp and paper mill drainage problems with our twill weave, plain weave, sewed seam, and soldered seam wires.

INTERNATIONAL WIRE WORKS
Menasha, Wisconsin

ROOFING MACHINERY MFG. CO.
Factory and Office
1130 W. Cornelia Ave.
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Designers and Builders of

Tar and Asphalt Saturators

Laminating Equipment

Embossing Units (brick siding, etc.)

Coating Machinery

Looping, Drying, and Cooling Systems

Winders for Roll Roofing

Shingle Cutting Machines

We also manufacture cutting cylinders, anvil rolls, squeeze rolls. We make a specially constructed steam jacketed 2" and 3" pump for handling viscous materials, such as filled asphalt, heavy lubricating oils, vegetable oils, paints, etc.

THE STUFF THAT HELPS WIN WARS

SPRUCE WOOD—CELLULOSE FIBERS—it looks peaceful and harmless enough. But without it modern war could not be waged—and won.

From explosives to plastics, the list of strange products that come from this source is a long one.

But just as important as these in the winning of the war is the paper that is made from those same spruce logs. Orders, records, reports—all written on paper—speed our armies and help us on the home front to back up the fighting men.

Paper is important; let's use it carefully.

HAMMERMILL

HAMMERMILL PAPER COMPANY

ERIE, PENNSYLVANIA

figures released by the Department.

The safety drive in the paper and pulp industry was the second such drive to be undertaken jointly by an industry, its workers, State labor departments, national safety agencies, and the Federal Government. The progress of this contest follows the same downward trend as the first one (slaughtering and meat packing).

The accompanying table shows frequency rates of 25 states for the three months of the contest—October, November, and December, 1944. Also shown are comparative frequency rates for the same states for the year 1943, the first six months of 1944, and the third quarter of 1944.

Late figures for the month of December (only) for states not shown in the table are as follows:

	Man-Hours	Freq.
Colorado	16,890	0.0
Connecticut	260,506	35.9
Delaware	63,407	81.1
District of Columbia	25,825	31.2
Iowa	27,158	147.3
Kansas	14,805	67.1
Rhode Island	73,703	0.0
Tennessee	176,078	11.4
Texas	263,930	3.9
Vermont	212,101	18.9
West Virginia	65,306	0.0
	1,169,889	

The total man-hours for all states reporting for the month of December, the third month of the drive, was 27,607,433, with a frequency of 25.5.

THE WATERBURY FELT CO.

TRADE MARK

The Trade-Mark of

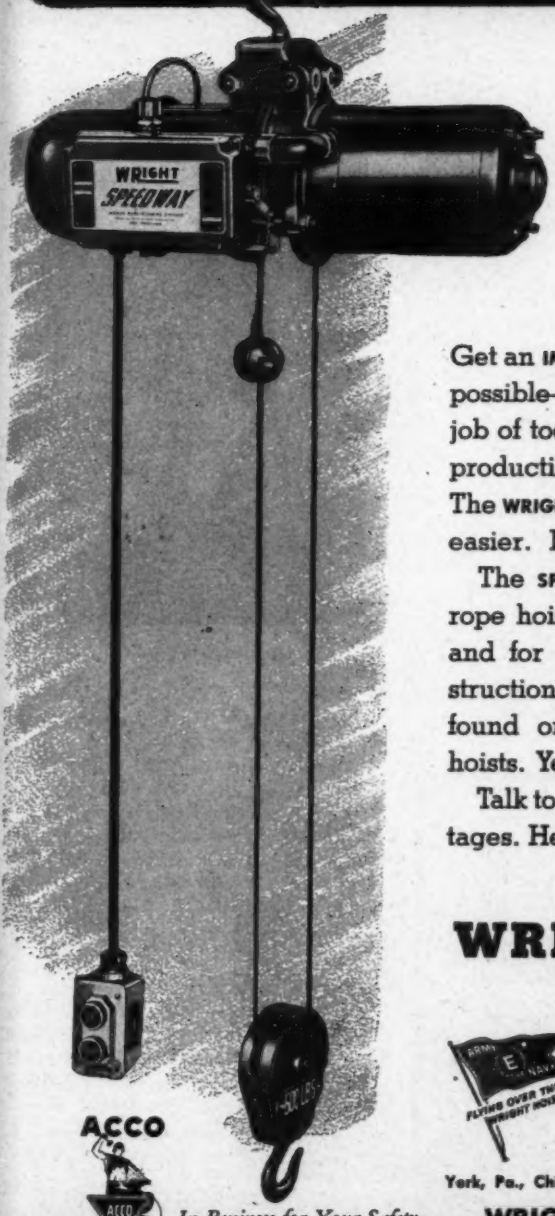
Always Reliable Felts

SKANEATELES FALLS NEW YORK

Job Accident Frequency in Paper and Pulp Industry

State	1943 Annual		Jan.-June 1944		July-Sept. 1944		October, 1944		November, 1944		December, 1944	
	Man-Hours of Exposure	Freq.	Man-Hours	Freq.	Man-Hours	Freq.	Man-Hours	Freq.	Man-Hours	Freq.	Man-Hours	Freq.
Alabama	5,765,869	15.1	3,393,652	17.4	2,040,325	22.1	563,492	17.7	412,790	4.8	341,371	14.6
Arkansas	3,973,034	43.0	686,209	35.0	1,085,643	31.3	209,623	14.3	330,416	21.2	125,834	15.9
California	5,479,270	27.0	2,643,225	48.4	2,473,499	38.7	523,160	17.2	534,024	41.2	551,439	30.8
Florida	7,606,231	31.6	2,896,485	21.8	1,880,185	26.1	820,069	25.6	621,468	19.3	632,225	23.7
Georgia	4,190,855	39.4	1,857,783	31.8	1,085,078	47.0	380,777	31.5	372,354	34.9	349,884	28.6
Illinois	7,494,802	32.3	3,029,655	25.1	2,211,498	30.3	517,635	44.4	532,375	37.6	524,525	15.3
Indiana	2,722,793	50.7	1,537,957	52.7	832,365	34.8	242,315	37.1	253,275	31.6	206,036	72.8
Louisiana	17,981,952	23.6	6,585,353	21.9	2,977,651	19.5	1,084,760	13.8	858,796	16.3	1,194,098	21.8
Maine	31,058,712	27.9	14,256,024	33.6	7,213,849	35.6	2,701,978	22.9	2,427,011	27.2	2,504,181	31.5
Maryland	1,025,131	53.7	2,174,717	29.9	790,607	37.9	371,942	24.2	377,127	21.2	334,605	20.9
Mass.	19,908,823	34.5	16,908,552	23.0	5,048,021	38.0	1,814,095	29.2	1,939,984	27.8	1,903,964	28.4
Michigan	32,641,545	33.8	9,188,169	29.6	4,552,793	32.3	1,551,630	28.4	1,783,273	30.8	1,634,033	22.6
Minnesota	12,058,644	29.5	4,836,235	28.5	2,466,762	28.4	863,848	20.8	845,374	30.8	851,694	35.2
Mississ.	9,860,212	21.4	3,099,288	29.0	2,144,703	16.1	254,407	3.9	697,569	17.2	684,049	21.9
N. Hamp.	16,466,138	35.3	3,076,507	42.9	1,726,375	30.7	581,617	44.7	548,654	41.9	627,878	36.6
N. Jersey	9,838,496	37.7	3,931,482	44.5	2,404,365	32.0	570,937	28.0	995,463	28.1	924,123	23.8
New York	32,781,158	28.7	11,504,470	32.5	7,448,977	32.9	2,696,046	25.2	2,499,184	29.6	2,551,986	32.9
N. Carolina	6,832,379	22.4	4,474,176	25.5	2,695,170	21.9	926,612	15.1	945,079	15.9	848,543	9.4
Ohio	13,395,371	28.4	8,557,483	28.9	3,914,616	22.5	953,115	22.0	1,541,822	13.6	1,264,790	16.6
Oregon	4,372,024	57.0	3,197,163	61.6	1,382,051	53.5	361,075	63.7	502,910	57.7	486,398	45.2
Penn.	22,791,867	25.2	11,258,159	28.2	6,136,740	31.4	2,030,036	27.8	1,990,524	24.6	1,713,405	24.5
S. Carolina	4,240,619	28.3	1,989,595	27.1	1,168,308	24.0	471,664	23.3	516,813	5.8	536,363	9.3
Virginia	5,966,642	40.1	2,802,030	38.9	2,292,138	31.8	951,531	21.0	709,762	29.6	673,316	31.2
Washington	18,433,721	36.6	8,984,010	41.3	2,963,086	42.9	1,215,996	39.5	1,438,393	33.4	1,386,461	40.4
Wisconsin	47,583,566	16.6	19,965,015	16.9	10,781,544	19.2	3,998,597	13.5	3,484,794	18.9	3,586,343	15.9
Total National	367,808,818	28.4	160,029,568	29.6	82,151,696	29.8	27,999,875	24.7	28,315,982	26.1	26,437,544	25.7

...SPEED IS ESSENTIAL TODAY ...AND TOMORROW



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The **SPEEDWAY ELECTRIC** is a sturdy, lightweight, wire rope hoist, designed for fast lifting on assembly floors and for general use. Designed with spur gear construction, magnetic control and mechanical features found only in the more expensive production-type hoists. Yet it is priced economically low.

Talk to your **WRIGHT** distributor about **SPEEDWAY'S** advantages. He is listed in your classified telephone directory.

WRIGHT SPEEDWAY HOISTS

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WRIGHT MANUFACTURING DIVISION

ACCO

In Business for Your Safety

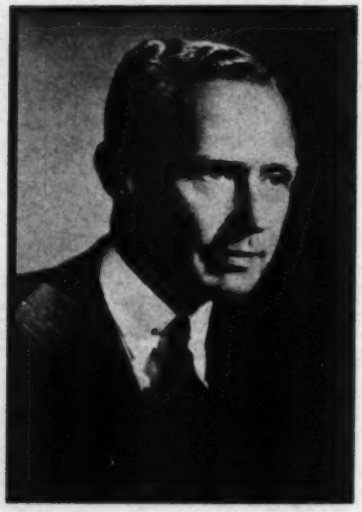
AMERICAN CHAIN & CABLE • BRIDGEPORT

NAMES *in the* NEWS

Personals

RIEGEL PAPER CORPORATION ANNOUNCES NEW OFFICERS

Election of new officers has been announced by the Riegel Paper Corporation, New York City. Walker Hamilton has been made executive vice-president and general manager after serving the company as purchasing agent, secretary and vice president.



Walker Hamilton

Other promotions were those of Fred I. Jacoby from general superintendent to vice president, and Frederick Leimbach to assistant to the general manager. George C. Borden, Jr., who had been acting technical director, is now technical director, and also continues as manager of the coating department. A. W. Osborn has been appointed superintendent of the coating department.

◆

▶▶▶ Since 1921, *R. O. Herbig* has been district sales manager in Chicago for The Reliance Electric and Engineering Company, Cleveland. The company announces that Mr. Herbig has been appointed central sales manager of the company.

◆

▶▶▶ The directors of the American Brake Shoe Company, New York City, have appointed *T. W. Pettus* president of the National Bearing Division, St. Louis, Mo. Mr. Pettus has been executive vice president of the National Bearing Metals Corporation, formerly a subsidiary of the parent company. On December 7th, 1944, it was merged with American Brake Shoe Company and became a division. Other officers of the division are, vice presidents—*T. H. Wright*, R. S. *Herman*, *A. N. Dugan*, and *W. E. Cartwright*.

◆

▶▶▶ The Swenson Evaporator Company Division of Whiting Corporation, Harvey, Illinois, announces the appointment of *Sam Van Deest* as manager of its Douthitt Gray-Jensen Department. Mr. Van Deest will be in charge of sales and engineering of Douthitt Gray-Jensen spray drying plants for the dairy and food industries.

◆

▶▶▶ The appointment of *W. R. Persons* as assistant sales manager has been announced by The Lincoln Electric Company, Cleveland, Ohio. In his new post, Mr. Persons will act as assistant to C. M. Taylor, vice president and general sales manager.

◆

NEW APPOINTMENTS ANNOUNCED BY THE M AND O COMPANY

Announcement has been made by R. H. M. Robinson, president of the Minnesota and Ontario Paper Company, Minneapolis, Minnesota, of the appointment of Milton S. Wunderlich, general sales manager of the Insulite Division, as director of research of the parent company and its affiliates. Becoming a member of the Minnesota and Ontario Paper Company's research staff in 1932. Mr. Wunderlich assisted the sales department in the technical phase of the company's selling activities. In 1935, he was sent to the Insulite mill in Finland as engineering consultant. On returning to this country, he again took up research work, and in 1938 was transferred to the Insulite mill at International Falls, Minnesota, as assistant resident manager. Since 1942, he has been general sales manager of the Insulite Division.

Milton S. Wunderlich

M. C. Fairfield

M. C. ("Al") Fairfield, merchandising manager of the Insulite Division, will succeed Mr. Wunderlich as general sales manager. Mr. Fairfield's first work in the insulating field was with the Flax-Li-Num Insulating Company, St. Paul, Minnesota, in charge of advertising and sales promotion. In 1935, he came to Insulite as advertising manager and was appointed merchandising manager in 1940.

◆

▶▶▶ After serving two years and six months overseas with the Canadian Navy, *Commander K. S. Maclachlan* (ret.) has returned to civilian life. He has just been elected president and appointed managing director of Standard Chemical Company, Ltd.

◆

▶▶▶ When he retired from active work in 1936, *Dana C. York*, had been woods manager for the Oxford Paper Company, Rumford, Maine, for 26 years. Mr. York passed away February 22 at the age of 61.

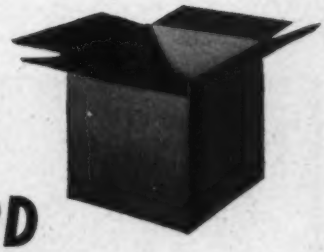
The DEFIBRATOR-CHEMIPULPER

IN SUCCESSFUL MILL OPERATION . . . PRODUCING PULPS FOR MANUFACTURE OF

PAPER

FOR

BOX BOARD



UTILIZING CONIFEROUS AND DECIDUOUS WOODS INCLUDING WASTE FROM SAWMILLS, VENEER MILLS AND FOREST (CATFACES) ALSO STRAW, BAGASSE, ETC.

•

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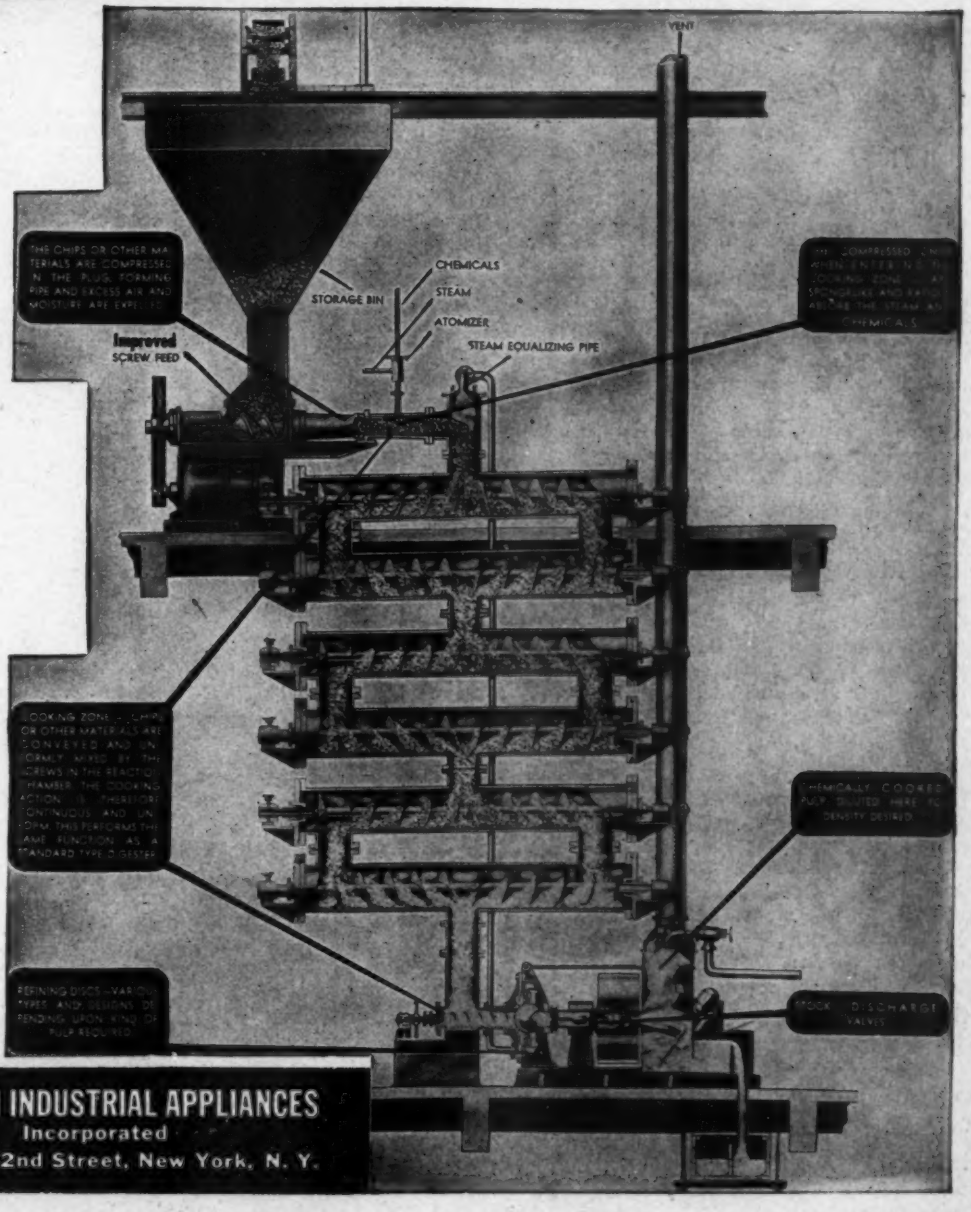
patented and patents pending.


VENT
THE CHIPS OR OTHER MATERIALS ARE COMPRESSED IN THE PLUG, FORMING A PIPE AND EXCESS AIR AND MOISTURE ARE EXPELLED
CHEMICALS
STEAM
ATOMIZER
STEAM EQUALIZING PIPE
STORAGE BIN
Improved SCREW FEED
THE COMPRESSED CHIPS WHEN ENTERING THE COOKING ZONE ARE SATURATED AND RAPIDLY HEATED BY THE STEAM AND CHEMICALS
COOKING ZONE—CHIPS OR OTHER MATERIALS ARE CONVEYED AND UNIFORMLY MIXED BY THE SCREWS IN THE REACTION CHAMBER. THE COOKING ACTION IS THEREFORE CONTINUOUS AND UNIFORM. THIS PERFORMS THE SAME FUNCTION AS A STANDARD TYPE DIGESTER
CHEMICALLY COOKED PULP DILUTED HERE TO DENSITY DESIRED
REFINING DISCS—VARIOUS TYPES AND DESIGNS DEPENDING UPON KIND OF PULP REQUIRED
STOCK DISCHARGE VALVE

PAPER and INDUSTRIAL APPLIANCES
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FRANKLIN R. HOADLEY IS NEW PRESIDENT OF FARREL-BIRMINGHAM CO.

The new president of the Farrel-Birmingham Company, Ansonia, Connecticut and Buffalo, New York, is Franklin R. Hoadley, who has been associated with the company since his graduation from Yale University in 1914, except for his service in World

Franklin R. Hoadley

War I. Returning to the company in 1918, he became foundry manager in 1919, and in 1930 was made vice president and a member of the Executive Committee. He also has been a director since 1923.

For the past eight years, Mr. Hoadley has been president and treasurer of The Atwood Machine Company, Stonington, Connecticut, which has been purchased by the Farrel-Birmingham Company. Mr. Hoadley will continue general supervision of the Atwood plant, also assuming general management of the company's other three plants in Ansonia and Derby, Connecticut, and Buffalo, New York.

◆

▶▶▶ The appointment of *G. A. Russell* as central division manager with headquarters at Chicago has been announced by The Dicalite Company of New York. Mr. Russell, formerly manager of the Kansas City office, has been a member of the Dicalite organization since 1931. *H. L. Dunham*, district manager of the Cleveland office since 1941, is now eastern division manager at the New York office. Dr. Dunham had been connected with the Mundet Cork Company, Hillside, New Jersey; Philip Carey Company, Cincinnati, Ohio, and the Government Park Service, before joining The Dicalite Company.

▶▶▶ The transfer of *James Tomlinson* from the New York office of Brown Company to the company's Berlin (N. H.) office has been announced. He has been made manager of the Financial department of the company. Recently, Mr. Tomlinson passed the New York bar examination.

◆

▶▶▶ The appointment of *R. E. Sprenkle* as hydraulic engineer of Bailey Meter Company, Cleveland, Ohio, has been announced. In this capacity, Mr. Sprenkle will continue to act as consultant on all problems of fluid flow and will supervise research on fluid flow. He will also co-operate with civil and sanitary engineers in working out the problems of metering and control equipment arising during the design of water supply and

R. E. Sprenkle

sewage treatment plants. Mr. Sprenkle is a member of the ASME Research Committee on Fluid Meters, and is the author of a number of technical papers treating various phases of flow measurement.

◆

▶▶▶ The recent appointment of *Stanley H. Reed* as assistant sales manager has been announced by The Crystal Tissue Company, Middletown, Ohio. Mr. Reed, who has been in the company's sales department for the past seven years, will replace W. E. Piper, who has resigned.

◆

▶▶▶ Southwestern representative for the Flexible Steel Lacing Company, of Chicago, *J. W. Gillespie* passed away at his home in Dallas, Texas, December 18 at the age of 53. He is survived by his widow and a son, Lt. James W. Gillespie, of the U. S. Army.

▶▶▶ Head of the company's news bureau since 1943 when he first became associated, *John J. Yezbak* has been appointed manager of public relations, as well as the news bureau, of The Timken Roller Bearing Company, Canton, Ohio. Mr. Yezbak has had wide experience in both advertising and newspaper work, having operated his own advertising agency in Cleveland for several years prior to his association with Timken.

◆

MERTON FOGERTY HAS BECOME ASSOCIATED WITH BRYANT-TIME

Merton S. Fogerty, for eight years chief engineer of the Michigan Paper Company, Plainwell (Mich.), joined the Bryant Paper Company, Kalamazoo, as superintendent of power and maintenance in February and continues in that position under the new ownership of Time, Inc.

Fogerty is an engineer with 31 years of experience in the paper business, a field he entered immediately after his graduation from the Worcester Polytechnic Institute at Worcester, Massachusetts. His early years in the industry were spent in the engineering departments of Bird and Son, East Wal-

Merton S. Fogerty

pole (Mass.); the Abitibi Power and Paper Company, Ltd. (Canada); The Kimberly-Clark Paper Company (Kimberly, Wis.), and other paper mills.

His first post as chief was with the Groveton Paper Company, Groveton, N. H., and from there he went to the Michigan Paper Company. While in that position, Mr. Fogerty supervised rebuilding of the power plant and built a new coating department, installing machinery that had been used in the coating division the company maintained in Kalamazoo.

ONE HUNDRED BILLION BUGS TURN UP TOES!

U. S. Navy Orders 40 Carloads of Insecticide Judged "Essential" as Health Insurance for Armed Forces!

Bowser Can Filling Unit Fills 450 1-Gallon Cans Every Hour!

* * *

When a large eastern chemical manufacturer received an order from the Navy for 40 Carloads of insecticide (320,000 gallons) an acute problem arose. How could they fill 320,000 1-gallon cans quickly in order to meet delivery dates? Prompt delivery was vitally important as the insecticide was to be used to destroy all types of vermin aboard ship and on shore.

The problem of high-speed filling was solved quickly when this company installed a Bowser can filling unit equipped with a temperature and specific gravity adjustment dial. Thus Bowser equipment met all rigid Navy specifications which demanded that every can be filled according to weight. With this equipment and in spite of the small size of the can openings, inexperienced girls were able to fill better than 450 1-gallon cans an hour! This same Bowser Equipment has also been used for filling 5-gallon benzol cans and 1-gallon cans of Xylol and Xylene—also delivered in carload lots.

Of course, the kind of equipment described above isn't used by the paper industry. Yet it does serve as an illustration of the scope of Bowser liquid control. For example, in virtually every pulp and paper mill throughout the United States and Canada, Bowser Lubricating Systems are standard equipment. These world-famed systems lubricate dryers, calender stacks, Jordans, hydrafiners and turbines.

For complete and detailed information, write to BOWSER, INC., Dept. 16-C, Fort Wayne 2, Ind.

Not only has Bowser's war production earned the Army-Navy E... Bowser equipment has helped earn it for scores of other companies.

THE NAME THAT MEANS EXACT CONTROL OF LIQUIDS

BOWSER

SINCE 1885

NUMEROUS FIELD CHANGES MADE BY MARATHON CORP.

Changes and additions to the field sales force of the jobber sales division have been announced by the Marathon Corporation, Menasha, Wisconsin, to provide better coverage of territories and improved service for jobbers. Gordon Becker is taking over the Cleveland area, being replaced in Pittsburgh by Len Nichols. The Indiana territory formerly handled by Nichols will be served by on Kneipple. Mr. Kneipple has had 12 years sales experience in the Indianapolis section.

Clarence Young has been moved from Cincinnati to Appleton, Wisconsin, to cover the Wisconsin and Upper Michigan area. Bob Kuehl, who formerly handled this territory, is now specializing in product development at the Menasha, Wisconsin, office, with emphasis on frozen food locker packages and specialties. Jim Smith, a new Marathon salesman with several years' experience with the paper trade in the New York jobber field, takes over the Buffalo area.

Robert King will represent the jobber division in North Carolina. He has had several years' experience in the grocery and produce field, both retail and wholesale. Two other representatives who are being transferred from the Menasha sales office to the field force are Jack Thomsen, assigned to the middle Ohio territory, and Cliff McCarthy, who takes over the Milwaukee assignment from Jim McKenny. McKenny has resigned to become sales manager of the Universal Paper Company in Appleton, Wisconsin.

◆

▶▶▶ The resignation of *Dr. Chester L. Samuelson*, medical director of the Brown Company, Berlin, New Hampshire, has been announced. Dr. Samuelson has taken a similar position with the Harrison Radiator Company, of General Motors, at Lockport, New York.

◆

STEPHEN A. CASEY JOINS ST. REGIS SALES STAFF

A new appointment to its paper sales staff has been announced by St. Regis Paper Company. Stephen A. Casey joins St. Regis after having been associated with the C. T. Deering Printing Company, Louisville, Kentucky, as production manager.

Mr. Casey will represent St. Regis in the southwestern territory for printing, converting, and specialty papers, with headquarters in the company's Chicago office.

He is well known in the paper and printing industries. Previously, he was production manager of Fawcett Publications and was connected with *Fortune* magazine.

Necrology

B. T. McBAIN

As this issue goes to press, word is received of the passing of B. T. McBain in Portland, Oregon, on March 2. Mr. McBain had long been a prominent figure in the industry, and recently had become identified with a newly formed organization known as the Forestry Research Foundation.

For the past twelve years, Mr. McBain had been associated with the Portland General Electric Company, filling the position of purchasing agent during the past four years.

◆

FRANK E. HOLBROOK

An old-timer in the paper industry passed away on February 27 at the age of 68. Frank E. Holbrook, former mill manager of the Oxford Miami Paper Company, West Carrollton, Ohio, a subsidiary of the Oxford Paper Company (Rumford, Maine), had been engaged in the papermaking industry for forty-five years at the time he retired in 1942. During the time he was active, he became one of the well-known figures in the paper industry.

Mr. Holbrook entered the paper field with the Kimberly-Clark Corporation in Appleton, Wisconsin, when a very young man. In 1900, he went to the Great Northern Paper Company as superintendent of its mill at Millinocket, Maine, which at that time was the largest newsprint mill in the world. Later, he joined the International Paper Company as assistant manager of manufacturing. In 1921, he went with the Combined Locks Paper Company, Appleton, Wisconsin, as general manager of manufacturing. He joined the Oxford Paper Company in 1929, when he became mill manager of the plant in West Carrollton, a position which he held until his retirement.

Mr. Holbrook was born in Neenah, Wisconsin. He is survived by his widow and three children, a son and two daughters.

◆

▶▶▶ President of the Diamond Mills Paper Company, Saugerties, New York, *Ralph H. Thompson*, passed away recently at his home in New York. He succeded his father as head of the company in 1909, and kept the company in production as a manufacturer of high grade tissues and cigarette paper.

◆

J. E. TALTON

At the height of a very colorful experience in pulp mills throughout the South, J. E. Talton, pulp mill superintendent of Southland Paper Mills, Inc., Lufkin, Texas, passed away at the age of 42.

Mr. Talton had done outstanding work in sulphate pulp. Among many ideas he had developed for the improvement of quality and production in kraft pulp mills, was the Talton Reflux System for multiple effect black liquor evaporators, which had been patented by him. During the construction period of the Southland mill, he worked tirelessly with the engineers and officials of the company.

Mr. Talton began his pulp mill experience with Hummel-Ross Fibre Company in the bleach plant; later he was a sulphate cook and recovery room foreman. In 1936, he went with the Union Bag and Paper Company, at Savannah, Georgia, where he worked up to the job as foreman of two pulp machines. In 1937, he went to Crossett Paper Mills working up to the post of pulp mill tour foreman. It was during this period that he developed the Reflux System and put it to work in that mill. He became pulp mill superintendent at Crossett and held that position until 1941 when he went to Southland.

◆

▶▶▶ A director of The International Nickel Company of Canada, Limited, *James Lincoln Ashley* passed away suddenly in New York City on March 6. Mr. Ashley also was formerly secretary-treasurer of the Canadian company, and vice president and treasurer of The International Nickel Company, Inc., of the United States. At the time of his retirement in December, 1939, he was the one person in the organization who had attended in one official capacity or another, every annual meeting of the present and predecessor companies since the original International Nickel Company was formed in 1902.

◆

▶▶▶ The Lockport Felt Company, Newfane, New York, has announced the sudden passing on February 27 of *Frank S. Murphy*, of Appleton, Wisconsin. Mr. Murphy had been with the Lockport company for twenty-five years, covering the Middle West. He is survived by his widow and two sons.

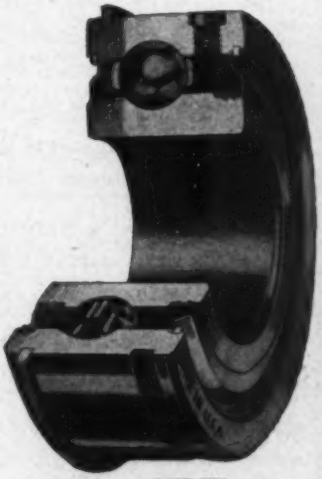
THAT EXTRA SOMETHING...

FOR THE LONG, HARD PULL

IN AN ATHLETE, it is called "STAMINA." In a ball bearing, it is DURABILITY—and it is determined by the inbuilt features that safeguard against wear and break-down.

The NORMA-HOFFMANN "CARTRIDGE" BALL BEARING has all these vital features, developed to the last degree:—wear-less, friction-free, all-metal seals (removable and replaceable) sealing lubricant in and dirt out, regardless of shaft angle; at least double the grease capacity of any other single-row bearing. A design that holds the grease ON THE ROLLING SURFACES, where it is most effective.

Read about these, and other, valuable features of the NORMA-HOFFMANN "CARTRIDGE" BALL BEARING in the Catalog, sent on request. Or, ask our nearest office to have one of our Field Engineers call and explain.



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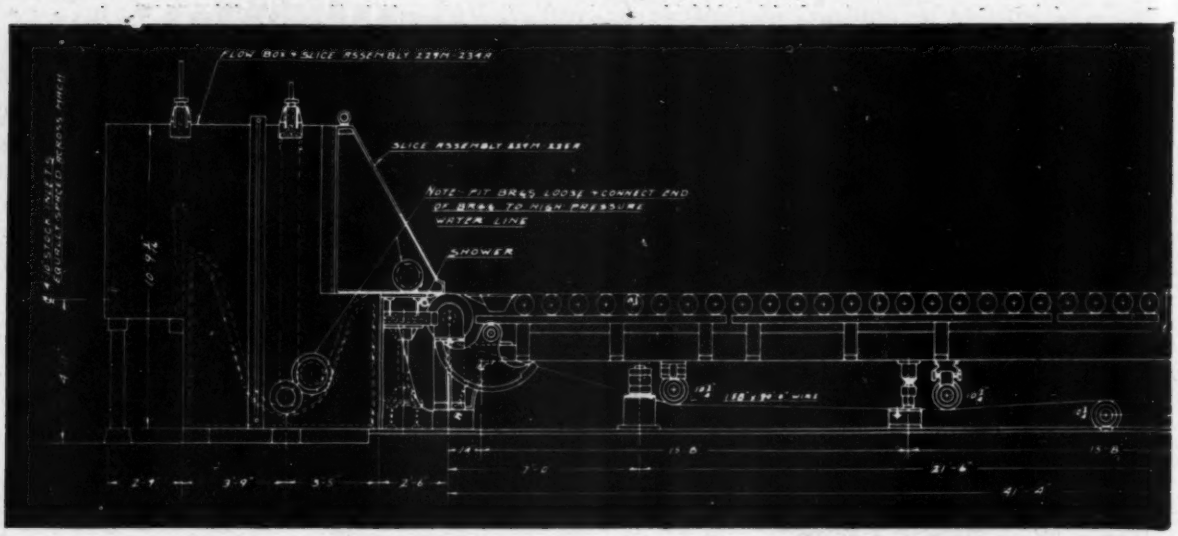
Field Offices: NEW YORK • CHICAGO • CLEVELAND • CINCINNATI • PITTSBURGH • DETROIT • LOS ANGELES • SAN FRANCISCO • SEATTLE, WASH.


FLOW BOX + SLICE ASSEMBLY 22'9" 23'0"
SLICE ASSEMBLY 22'9" 22'8"
NOTE - FIT BRASS LOOSE, RECONNECT END OF BRASS TO HIGH PRESSURE WATER LINE
SHOWER

How to combat Corrosion on Fourdriniers

When planning essential replacements and future fourdriniers, consider these advantages of Monel:

1. Corrosive paper stocks and white waters as usually encountered have little or no effect on this high nickel alloy. There is no pitting...surfaces retain their original smoothness. The results shown in the table at the right are typical of Monel's corrosion resistance.
2. Under exposure to the corrosive conditions generally met, Monel is used safely in combination with bronze and copper fourdrinier parts.
3. Monel is both stronger and tougher than mild steel. Its resistance to sagging is practically twice that of brass.
4. Any of the commonly used methods may be employed for welding, soldering or brazing. In addition, Monel is readily machined, drawn or forged.

Ask our technical staff for assistance with your problems. Among the helpful publications available are "*Selection Guide to 28 Problems on Fourdriniers*" and Bulletin C-3 "*Monel, Nickel and Inconel in Pulp and Paper Mills.*" Write for copies.

PRINCIPAL USES OF MONEL ON FOURDRINIER WET ENDS

Flow Boxes—Monel linings from .037" to ⅛" thick are applied to wood or steel boxes. Some are of self supporting Monel sheet construction, or built from nickel-clad steel.

Flow Box Midfeathers—Wood construction lined with .037" to .062" Monel sheet.

Apron Plates—Monel strip from 1/16" to ½" thick, supported by steel frames.

Slice Blades—(flat bar type and flexible slices). These are of ⅛" to ¼" thick, special temper cold rolled Monel strip. Flexible slice lips up to 250" long are supplied.

Breast Rolls—Steel rolls covered with ⅛" to ¼" Monel provide wear and corrosion resistance as well as high stiffness at relatively light weight.

Table Rolls—Monel seamless tubing for diameters up to 5". Monel-covered steel tubes for larger diameters.

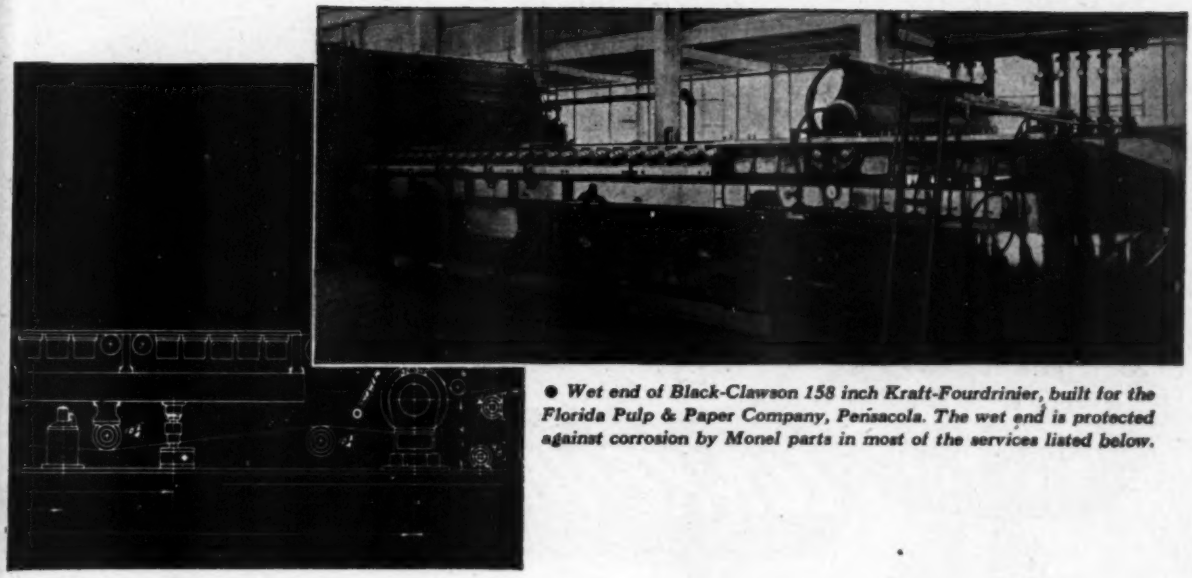
Dandy Rolls—An especially rigid and corrosion resistant roll body is built from Monel strip and wire with Monel wire cloth facing.

Suction Boxes—Boxes welded from ⅛" and ¼" Monel sheet are strong and of light weight.

Suction Box Covers—Monel covers have been used 2 years and more without resurfacing. Covers are made from ¼" thick full hard temper Monel strip.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK 5, N. Y.

Monel



● *Wet end of Black-Clawson 158 inch Kraft-Fourdrinier, built for the Florida Pulp & Paper Company, Pensacola. The wet end is protected against corrosion by Monel parts in most of the services listed below.*

Wire Return Rolls—Monel covers (⅛" thickness) over steel tubes. Roll covers are ground to finished diameter.

Fourdrinier Rails—.037" to .050" Monel sheet lined steel or cast iron rail construction.

Fourdrinier Side Beams—.037" to .050" Monel sheet lining over steel or cast iron rails.

Shaker Springs—"Z" nickel of full hard temper and age hardened is used for flat spring leaves of shakes with high stroke frequencies.

Save-All Trays and Pans—.062" to ⅛" Monel sheet is used generally for strong, durable, welded construction.

Cross Braces—.025" to .037" Monel is used for lining steel pipes.

Fourdrinier Brace Rods—Cold drawn Monel rods.

Remover Cross Drive Shafts—Cold drawn Monel rods.

Remover Beam Tracks—Gall resisting, high hardness cast "S" Monel for rollers or tracks; companion part is bronze.

Fourdrinier Remover Beams—.025" to .037" Monel sheet covered steel construction.

Shower Pipes & Nozzles—Seamless Monel tubing for pipes, and "R" Monel rod (200 BHN) for machined nozzles provide stiff and wear resisting showers.

Doctor Blades & Backs—Full hard Monel blades for bronze rolls. Monel sheet and angles for doctor back construction.

Bolts & Other Fastenings—Monel fastenings are used safely in combination with bronze or copper fourdrinier parts.

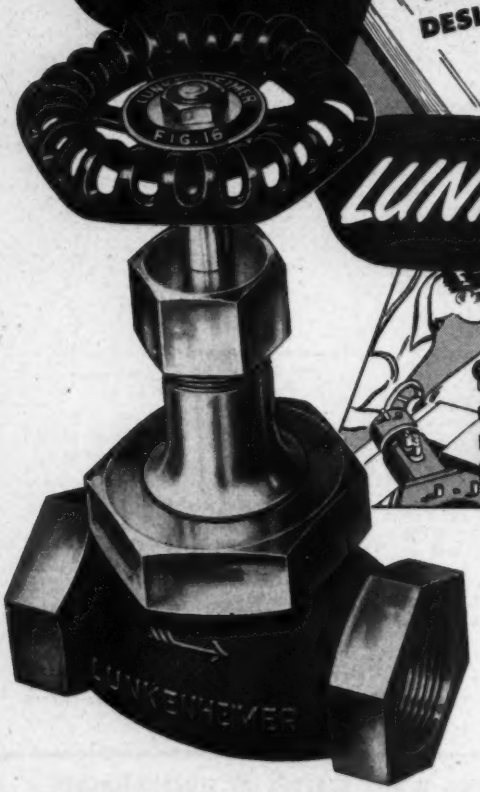
CORROSION RESISTANCE OF MONEL TO PAPER STOCKS AND WHITE WATERS OF FOURDRINIERS*

Paper Stock	*Location of Monel Specimen*	*Stock Consistency*	*pH of Stock*	*Temp.*	*Corrosion Rate in Inch Penetration per Year*	*Remarks*
DE-INKED PAPER stock containing small amounts of SO_2, CL_2 and H_2SO_4	Immersed in headbox Middle West Mill.....	.....	4 to 4.5	.....	0.0001	Smooth surface, no pitting
NEWS PRINT 80% groundwood, 15% unbleached sulfite pulp	Immersed in headboxes 3 Northwestern Mills.....	2.8% to 3%	4.7 to 5.1	85° F. Average	0.0003 to 0.0014	Smooth surface, no pitting
KRAFT alum treated	Immersed in headboxes Northern Mill..... Southern Mill.....	....	6.5 to 7 4.5 to 6	95° F. Average	0.0001 0.0005	Smooth surface, no pitting
SULFITE bleached pulp	In save-all trough Middle West Mill.....	0.1%	6.8	140° F. Average	0.0008	Smooth surface, no pitting
BOND AND STATIONERY 100% linen and new cotton, rosin and alum sized	In feed line ahead of machine screen Eastern Mill.....	0.5%	6.5 to 7.3	84 to 130° F.	less than 0.0001	Smooth surface, no pitting
CIGARETTE PAPER	In white water box connected with suction boxes Southeastern Mill.....	.....	9.0 to 10.0	66 to 75° F.	less than 0.0001	Smooth surface, no pitting

**Tests conducted by paper mills in collaboration with Inco Development & Research Division.*
Test method in accordance with ASTM specification A 224-39T.

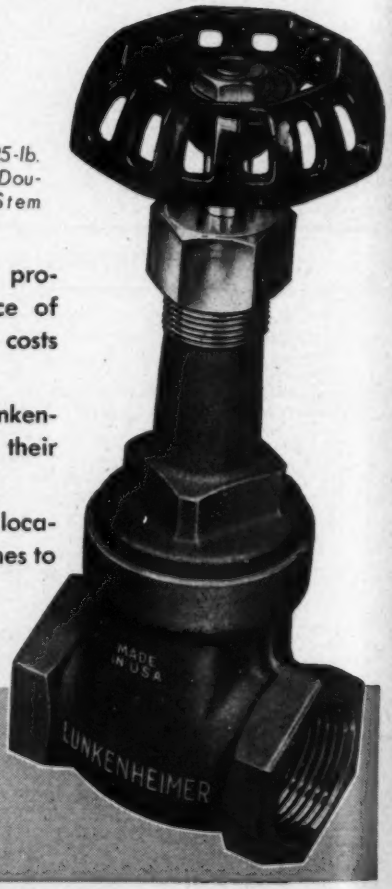
Quality RULES SUPREME IN PRODUCTION OF...

LUNKENHEIMER VALVES



● *Fig. 16 — Bronze "RENEWO" GLOBE*

● *Fig. 2125 — 125-lb. S. P. Bronze Gate, Double Disc, Rising Stem*



● At every step in manufacture, *Quality is the watchword at Lunkenheimer . . .*

Quality you can *see* in every line of a Lunkenheimer valve . . . plus *built-in* quality that reveals itself in top performance and longer service life when these finer-made valves are put to work.

Simplicity of design, correct proportions and perfect balance of all parts, reduce maintenance costs to a very minimum.

On every industrial front, Lunkenheimer Valves are proving their exceptional staying qualities.

A Lunkenheimer Distributor is located near you, ready at all times to assist with your maintenance and operating problems.

ESTABLISHED 1862

THE LUNKENHEIMER CO.

"QUALITY"

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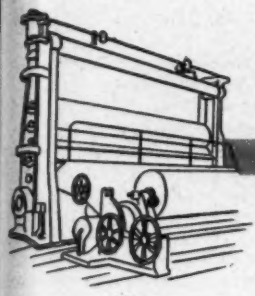
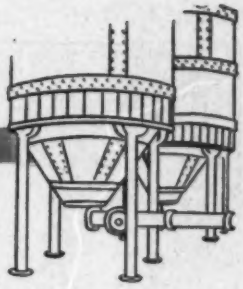
BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S.P.; BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS



Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Joint Bolting Technique

The great majority of joints are assembled by means of bolts. The amount of bolting required depends upon the joint operating conditions and the gasket to be used. Assuming that the total amount of bolting force required is known, the manner in which it is to be distributed around the gasket must then be decided upon. For example, two bolts of large diameter could supply the same total force as twelve smaller ones, but the distribution of that force would be poor. Therefore, in order to equalize as far as possible the distribution of the load on the gasket, a number of closely spaced bolts should be used.

Many four-bolt pipe flanges, valve bonnets and cylinder-head designs are typical examples of faulty distribution of bolt

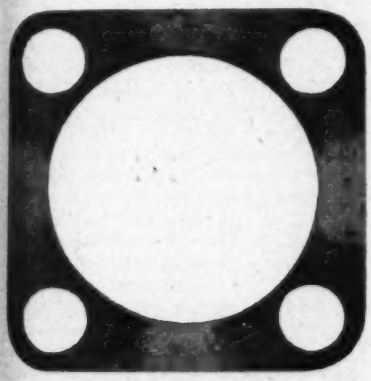


Figure 1

stress. Wide bolt spacing, combined with insufficient flange reinforcement, result in a condition of poor contract pressure distribution as illustrated by Figure 1.

This particular carbon paper print was obtained with use of a full-face two-piece French type gasket in the bonnet joint of a 300-lb. bronze angle valve. The bonnet flanges were insufficiently reinforced at the corners, hence were easily dished at relatively low bolt stresses. This test indicates a need for redesign of the bonnet flanges or, so far as possible, modification of the gasket to compensate for this unequal distribution of stress.

As an example of the correct distribution of bolt stress, the contact pressure print in Figure 2 shows the uniformity with which the gasket may be loaded in a standard eight-bolt flange. For comparison with the example given in Figure 1, a full-face two-piece French type gasket of similar construction was compressed in a standard 6 in. 125 lb. cast iron joint.

In a closure employing a number of bolts, the sequence in which the bolts are tightened has a substantial bearing upon the distribution of the contact area stress. The most common result of incorrect sequence in tightening is the cocking of the flanges out of parallel. The gasket will usually compensate for a small amount of distortion of this type, but serious difficulties may be encountered if close parallelism is not maintained. The correct sequence to employ, particularly with large diameter flanges of light construction, has been

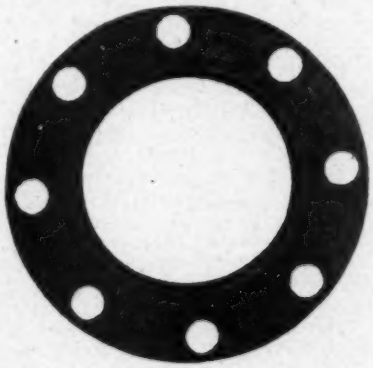


Figure 2

carefully worked out by several investigators and, although minor variations exist in the different methods, in general they are essentially as follows:

The bolts should be tightened first by hand. Then, tightening two bolts 180

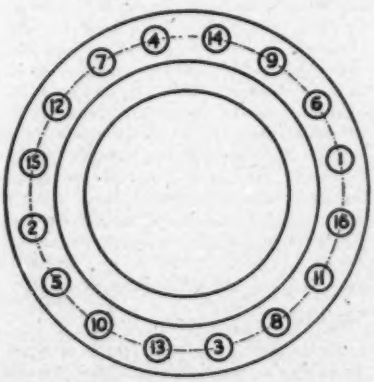


Figure 3

degrees apart, advance clockwise 90 degrees and repeat the operation, continuing until all the bolts are uniformly stressed. Figure 3 shows the correct method as outlined.

In connection with the sequence in which the bolts are tightened, it is important that the total amount of final stress desired be applied in small increments, otherwise distortion of the flanges will occur regardless of the sequence followed.—Goetze Gasket & Packing Co., Inc.

◆

Identifying Scaffold Planks

The selection of planks for use in scaffolds is a task which requires an accurate knowledge of the suitability of various kinds of wood, the signs of defects and the best methods of inspection and testing and it takes time. It is, therefore, wise to identify all such planks in some good manner so they may be easily located if they become mixed up with other planks. Furthermore, such planks should be used for scaffolds only and never for other purposes.

Never paint a scaffold plank all over. The paint hides defects that may develop in use. One of the most practical methods of identification is to paint the ends with a dark colored paint and to stencil the words "For Scaffolds Only" over it. The identification used should be standardized and kept uniform so that all employees in the company will recognize it. Safety Instruction Card No. 32, National Safety Council.

◆

Watch Stack Loss

Aside from a water glass and steam-pressure gauge, the most important instruments for any boiler are those that measure flue temperature and analyze gas. Every plant, no matter how small, should have at least a thermometer or pyrometer measuring flue-gas temperature and a hand Orsat for analyzing flue gas. The Orsat spots holes in grates, in the fire, or in the boiler setting. Without it there is no way to determine the correct damper setting and fan speed.

The flue-gas temperature spots leaky baffles, plugged heater or superheater tube banks and dirty boiler tubes.

In the accompanying table, pick the coal most like the one you are using and note the effect of reducing your flue temperature 100 Fahr. Next, try increasing the CO_2 content of the flue gas 2% at the

HEAT LOSS IN FLUE GAS, PER CENT

Including losses with varying amounts of excess air and moisture and hydrogen losses for high- and low-moisture, high-volatile bituminous coal.

Excess air	CO_2	Illinois Coal Flue-gas temperature					West Virginia Coal Flue-gas temperature				
Per cent	Per cent	300F.	400F.	500F.	600F.	700F.	300F.	400F.	500F.	600F.	700F.
125	8	14.5	19.0	23.5	28.0	33.0	13.5	18.0	22.5	27.0	32.0
100	9	13.5	18.0	22.0	26.0	30.0	12.5	17.0	21.0	25.0	29.0
80	10	12.5	16.5	20.0	23.5	27.5	11.5	15.5	19.0	22.5	26.5
65	11	12.0	15.5	18.5	22.5	25.5	11.0	14.5	17.5	21.5	24.5
50	12	11.5	14.5	17.5	21.0	24.5	10.5	13.5	16.5	20.0	23.5
40	13	11.0	13.5	16.5	20.0	23.0	10.0	12.5	15.5	19.0	22.0
30	14	10.5	13.0	16.0	19.0	22.0	9.5	12.0	15.0	18.0	21.0
25	15	10.0	12.5	15.5	18.5	21.0	9.0	11.5	14.5	17.5	20.0
Moisture and hydrogen losses alone, per cent		4.7	4.9	5.1	5.3	5.5	3.7	3.9	4.1	4.3	4.5

This table assumes all carbon in the coal burned, no CO in the gas and no carbon lost as coke in the ash or as soot. Where the carbon lost in the ash and refuse is under 4% of the total heat loss, this table is accurate within about 2%, assuming absence of CO in the flue gas.

same time. The difference is a direct increase in boiler efficiency. More important, it is a direct saving of coal. If you burn 100 tons of coal per day, at 70% over-all boiler efficiency, you really use only 70 tons; the other 30 tons are wasted. Now if you could increase this boiler efficiency to 75%, you would use 75 tons, and waste only 25 tons, or you would save five tons per day.—R. F. Stilwell.

◆

Overgreasing Motor Bearings Causes Overheating

The most common cause of high temperature in a ball bearing is too much grease. Motor manufacturers attach standard instructions to every ball bearing motor when it is shipped, and motor users are continuously warned against filling a ball bearing cavity full of grease. In spite of this, an over-conscientious maintenance man will add grease to ball bearings on a schedule, which results not only in the bearing cavity becoming stuffed with grease, but it may also force grease into the interior of the motor. Grease within a ball bearing cavity should not be continuously churned by the operation of the bearing. If there is sufficient space for the bearing to run free, it will clear a channel for itself, and operate with very low friction losses, and at a low temperature, obtaining its lubrication from the capillary flow of oil from the grease along the adjacent surfaces. The grease itself will occupy the space within the bearing caps without continually flowing into the bearing.

If the outer cap is removed after a ball bearing has been operating normally for some time, it will be seen that the grease which comes away with the cap is nearly as firm and solid as it was in the original container. The thin semi-liquid oily film covering the bearing provides proper lubrication which may last as long as two years or more without renewal. This ideal is apt to be prevented, however, by frequent additions of grease. It is much better to allow ball bearings to operate at least two months at a time with no attention whatever, and then when they are serviced, an inspection of the condition of the grease in the outside caps will indicate whether or not additional grease should be added. The outside caps can be removed for this inspection, or they can be inspected by merely shining a flashlight into the pipe plug opening in the cap.

The treatment for a very hot ball bearing is obviously to remove a large amount of grease from the bearing cavity, and to permit the motor to stand idle until the temperature is reduced to a point which allows the remaining grease in the bearing to solidify. Usually when this is done, the bearing will again operate continuously at its normal mild temperature.

The best grease for ball bearing operation is compounded from a soda base, has a fibrous or granular texture, and becomes liquid only at a temperature well above 100 C.

Excess grease can damage a bearing also by preventing the balls from turning immediately when a cold motor is started. A film of hard grease between the balls and the retainer holds the balls stationary for a moment, causing them to slide on the raceways of the bearing, and producing what ball bearing manufacturers call "smearing." This results in minute flat spots on the balls, and roughened tracks in the raceways. After this has once occurred, increasing roughness and eventual failure are the result. Roughness and a grating noise gives ample warning of this condition and such a bearing should be replaced before further damage to the motor results.—G. L. Ringland, *Allis-Chalmers Electrical Review* (December, 1944).

◆

Cockling

No single defect in a sheet of paper probably is less understood than that of cockling. When a sheet develops a pronounced cockle, the machine tender may be ordered to put more water in the sheet, to change press weights, to tighten dryer felts, and even to thicken the sheet in the area of the spots. He may even wash the felts or install a new one as a temporary means of alleviating the trouble; and then take out the press rolls over a week-end shutdown and have them trued up to improve operating conditions.

One of the most important factors that contributes to cockling, and which is so often overlooked, is carelessness in draining system maintenance. This neglect is especially important in the case of the bottom deck of dryers.

In the older systems of drainage, where all dryers discharge condensate into one header, the situation is bad enough at best. Among other difficulties, if proper maintenance is lacking and the dryers are allowed to run partly filled with water, the dryers are apt to spring, thus causing wrinkles. The addition of more steam simply aggravates the difficulty as high temperature is of itself a potential cause of cockling.

Another condition, also often overlooked, is the possibility of the bottom dryers transferring less heat to the drying surfaces than the top dryers. An accumulation of condensate in the dryers would cause such a condition.

Dryers carry more or less condensate at all times; but the location and quantity of this condensate, and the speed at which the dryers are traveling determine whether it will cause trouble.

If the dryers are traveling very fast, condensate will tend to follow a dryer shell in its direction of travel so there will be condensate on the upturning side of a dryer as well as on the bottom. Naturally, the most of the condensate accumulates in the bottom of the dryers, and it is there that all condensate elimination devices have their intake.

Heat transfer in a top dryer is better than in a bottom dryer because of the insulation effect of the condensate in the bottom dryer. It is true that there also may be condensate in a top dryer but the sheet in its travel over the dryers is in contact with the bottom of the bottom dryers, just where the condensate accumulates, and the top of the top dryers where there is no condensate.

If the bottom dryers are carrying too much condensate, the top dryers are forced to do more than their share of the drying; and additional steam pressure is required. The result is one-sided drying, perhaps cockles, because of the higher temperature of the contact area of the top dryers.

Dryer temperatures are often taken with a pyrometer. This instrument, however, cannot be applied to the contacting surface of the dryers because of the dryer felts. The contact on a top dryer, for example, must be made on the bottom of that dryer in the area where it is insulated by condensate within, and on the top of the bottom dryer where there is no condensate. Accordingly, slight as it may be, the top dryer may indicate a lower temperature than the bottom dryer; yet, as far as the drying of paper is concerned, the top dryer is doing more of the work.

Cockling commonly shows up in a sheet as a strip, the outside edge of which is from eight to twelve inches from its adjacent edge of the paper. The cause of a cockle may be due to a press roll lacking crown or to a dryer felt that bags in the middle. In either case, the sheet would

dry faster along the edges, thus causing it to shrink toward the middle of the machine and form a bulge in the paper. Such a sheet, when passing through the calenders, would dry cut.

The removal of more water from the presses is helpful in eliminating cockles since it permits the dryers to be operated at lower temperatures. If the dryer drainage system is not functioning properly, it must be put in shape — that each dryer is carrying its full load. If a dryer felt is worn badly, or is slack in the middle, it may be necessary to install a new one. If the slack cannot be taken out of the middle of a dryer felt, it should be taken off the machine. Such a felt draws in the edges of a sheet, thus creating a condition that causes cockling.

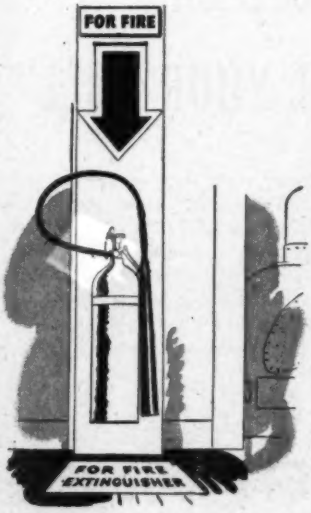
In the opinion of the author, the addition of water to the sheet on the fourdrinier table will not overcome cockling. This practice does no harm; but it accomplishes nothing.

On a Yankee machine, where there is only one dryer, it is necessary to use a high temperature for drying. Yet, in this case, the dryer felt prevents the edges of the sheet from drawing in until the paper is dry. Therefore, the tendency to cockle is less than with the usual dryer arrangement. Perhaps, it should be emphasized that there are few paper machines with ample drying capacity for the speeds at which it is desired to run them.—ARCHIE MCCAFFERY.

◆

Marking Fire Fighting Equipment Locations

Stations where fire fighting equipment is kept should be conspicuously marked. The markings should be placed high enough to be visible from a distance, above normal obstructions to vision—such as stock piles, machinery, etc.



One method is to paint a vertical red band or arrow on the wall behind the equipment.

A large red spot painted on the floor of aisles and under the equipment will serve as a continual reminder.

Lights of a distinctive color, not conflicting with the lights on emergency exits, are useful.

In addition to other markings, the words "FOR FIRE" should be clearly lettered on the wall behind the extinguishers.—WALTER KIDDE & CO., INC.

◆

Bad Saw Filing

No saws are so liable to crack in using as circular cut-off saws for the reason that they are generally filed so as to leave a square corner at the base of the teeth, and the bevel of the face being carried down into this corner, still further weakens it.

It is surprising that so many still persist in this manner of filing, when a few strokes with a round file at the base of the tooth after beveling the front, will keep it in good shape by preventing the formation of the square corners from which the crack starts. The saw will clear better if the bevel is carried down only half the depth of the teeth.—E. C. ATKINS AND COMPANY.

◆

Leather Belt Maintenance

Inasmuch as belts are the connecting link between power and production, it pays to have a competent individual in definite charge of their installation and maintenance. In any case, it is desirable to establish a system of inspection at regular intervals to check the following:

1. Is the belt too dry?
2. Is it dirty or saturated with oil?
3. Is it too slack or too tight?
4. Are the pulleys and shafting in alignment?
5. What is the condition of laps, plies, lacing and ends of laced belts?

If belt guard, shifters, guides or pulley flanges rub against edge of belt, laps and plies may open up. This condition should be corrected immediately. A good belt shifter has broad and well-rounded surfaces so as to spread thrust over a large belt edge area. A cause of ply and lap separation, is running too heavy a belt on too small a pulley.

If blisters occur on belt and an immediate repair is impossible, puncture the blister with a knife or awl on the trailing end. Travel of the belt over the pulley will then flatten out the blister and it can be cemented when time is available.

Belting will not give the best service if the pulleys or shafting are out of alignment. Indications of misalignment are: belt running off the pulley at one side or rubbing or climbing on flanged or step-cone pulleys.

A simple test to determine whether the fault is the alignment or a crooked belt, is to turn the belt inside-out or end-for-end. If it still runs to the same side of the pulley as before, the fault is in the alignment — not the belt.

It is important to check drive alignment at least once a year. In multiple-story buildings, shifting of loads on floor above shafting may cause it to be distorted or thrown out of alignment.

Some common faults in drive alignment are:

1. Shafting carrying driving and driven pulleys may not be parallel.
2. Shafting may be sprung out of line. (Hangers should always be located near the pulleys, the points of maximum load.)
3. Driving and driven pulleys may be offset.
4. Pulley may be eccentric with shafting.

Recrown fiber pulleys when they wear. When belts run off the center of motor pulleys, it may be due to a worn crown.—AMERICAN LEATHER BELTING ASSOCIATION.

◆

Correct Use of Hand Operated Hack Saw Blades

The drawings illustrate the most important things to remember.

Figure 1—Use a fine tooth blade on thin wall sections. At least two adjacent teeth must at all times be in contact with the metal being cut. Three teeth are much better. Otherwise the metal wedges up between the teeth, stripping them off. If the metal is too thin to allow following the "three-tooth" rule, use an extremely light, steady stroke.

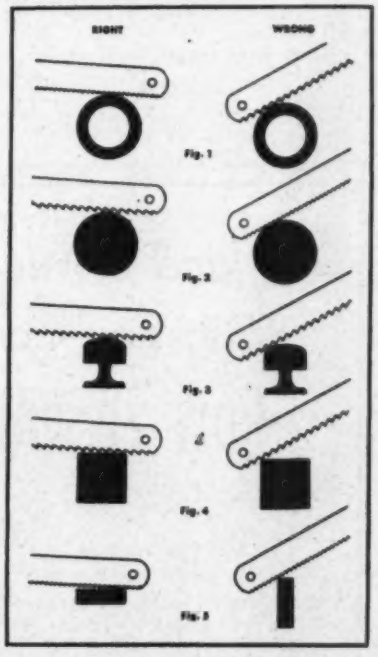


Figure 2—On thick stock use coarse tooth blades with heavy pressure. Thus you can apply more pressure per tooth, getting a deeper cut, and the larger space between the teeth will clear the large chips better.

Figures 3, 4 and 5—In starting a cut, keep off the sharp angles. Otherwise you will violate the "three-tooth rule" no matter what blade you use. On the other hand, a very slight angle with the flat surface of the work is advisable to help start the cut, so that the work will begin to guide the blade for you as soon as possible.—CLEMSON BROS., INC.

Newsprint Paper in 1944

ROYAL S. KELLOGG

▶▶▶ THE OUTPUT OF the paper and paperboard machines in North America in 1944 was in excess of 21,000,000 tons. This was a great accomplishment under wartime limitations of raw material, labor, repair and replacements. Every mill did the best it could. There was a demand for more than it could make and a large proportion of the product went directly into war use. The balance was so necessary to the maintenance of the American way of life that it also could be classified as an essential commodity.

In the United States the Bureau of the Census officially reports total output of 17,183,000 tons of which 8,973,000 tons or 52 per cent was paperboard. The Canadian and Newfoundland output of newsprint was 3,265,000 tons and there was undoubtedly a production in the neighborhood of 900,000 tons of other grades of paper in Canada during the year. This adds up to an approximate continental grand total of around 21,348,000 tons.

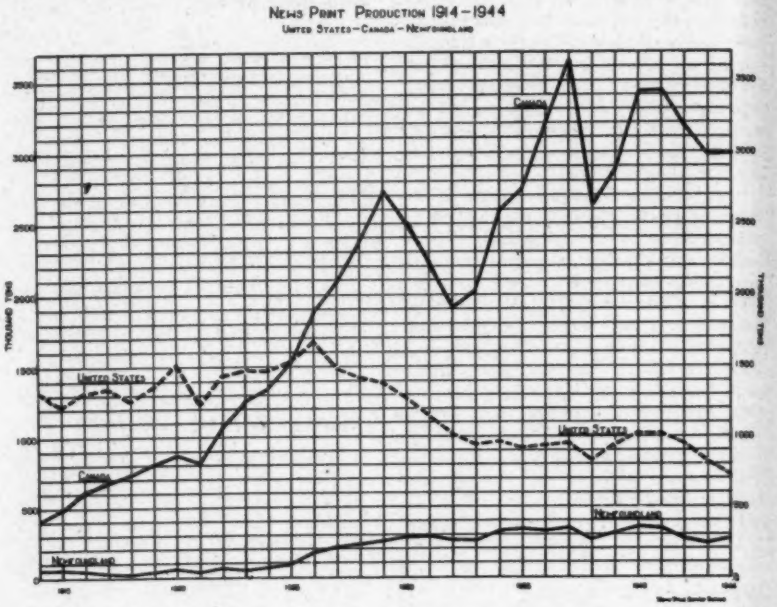
While figures are lacking, it is certain that under the circumstances the North American output of paper and paperboard in 1944 greatly exceeded the rest of the world combined.

The newsprint figures run as follows:

Production

The 3,984,000 tons of newsprint made in North America last year was only 1 per cent less than in the preceding year. It was supplied to the extent of 7 per cent by Newfoundland, 18 per cent by the United States and 75 per cent by Canada. There was a slight increase in the Canadian output—9,000 tons—over 1943, a decrease of 85,000 tons in United States production and an increase of 37,000 tons in Newfoundland production.

The newsprint total in Canada in 1944 ranked 6 per cent below the five-year average of 3,175,000 tons, for 1939-43. During the same half decade the New-



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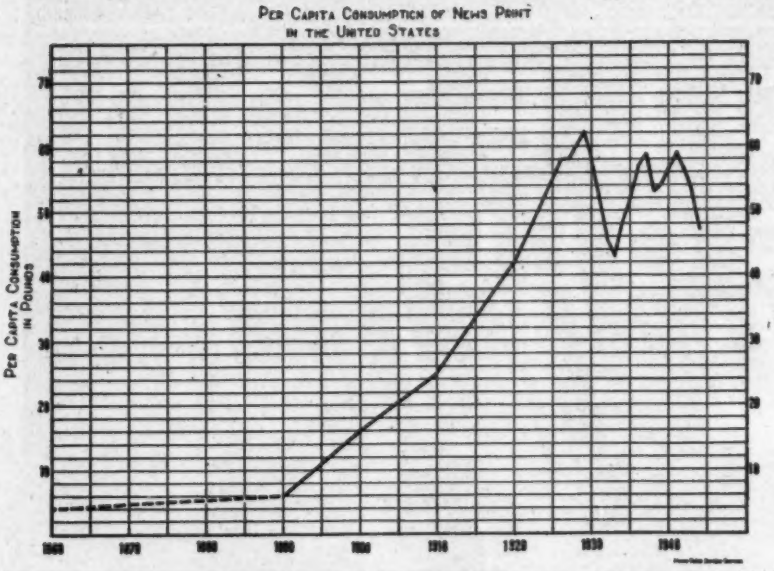

Year	Population	Newsprint Tons	Paper Used Per Capita Lb.
1935	127,521,000	3,300,000	51.7
1936	128,429,000	3,650,000	56.8
1937	129,257,000	3,830,000	59.3
1938	130,215,000	3,458,000	53.1
1939	131,878,000	3,550,000	54.1
1940	132,817,000	3,730,000	56.2
1941	133,923,000	3,930,000	58.7
1942	134,633,000	3,800,000	56.4
1943	136,497,000	3,650,000	53.5
1944	138,101,000	3,250,000	47.1

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HOUSE
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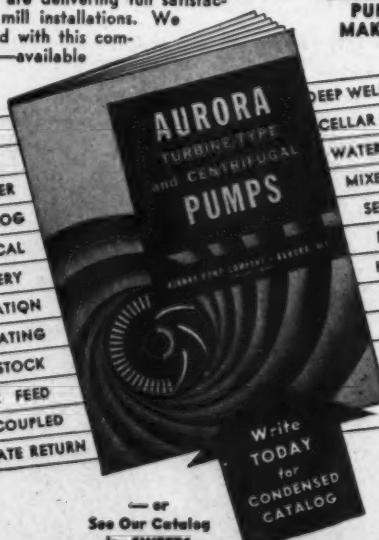
MANY
OTHERS



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foundland mills averaged 303,000 tons, so last year was 10 per cent under the recent average.

The amount of newsprint manufactured in the United States in 1944 was the least in any recorded year since 1900. At that time and for a number of years thereafter domestic mills were the only source of white paper for United States newspapers.

Shipments from the mills aggregated about 10,000 tons more than production during the year, so that on December 31 mill stocks were 10,000 tons less than a year earlier.

Exports

Exports of newsprint paper from Canada last year are reported by the mills to have been 2,813,000 tons or 94 per cent of production. This was only 3,000 tons less than they exported in 1943, but there was a substantial shift in destinations. In 1944 Canadian overseas shipments were 384,000 tons, compared with 267,000 tons during the preceding year. Correspondingly there was a decrease of 120,000 tons in mill shipments to the United States, the 1944 total being 2,430,000 tons compared with 2,550,000 tons in 1943.

Exports from Newfoundland were 7,000 tons more last year than in 1943, but

Royal S. Kellogg

here also there was a decided shift. Overseas shipments in 1944 amounted to 170,000 tons compared with 132,000 tons a year earlier. There was a corresponding decrease of 31,000 tons in shipments to the United States.

Exports of newsprint paper from the United States last year were static, approximately 15,000 tons, the same as a year earlier. It must be remembered that these are mill reports and that when official reports of newsprint exports are released by Washington they will undoubtedly be much larger because of the wide classification used by the Department of Commerce.

Taken altogether, the North American mills supplied 568,000 tons of newsprint

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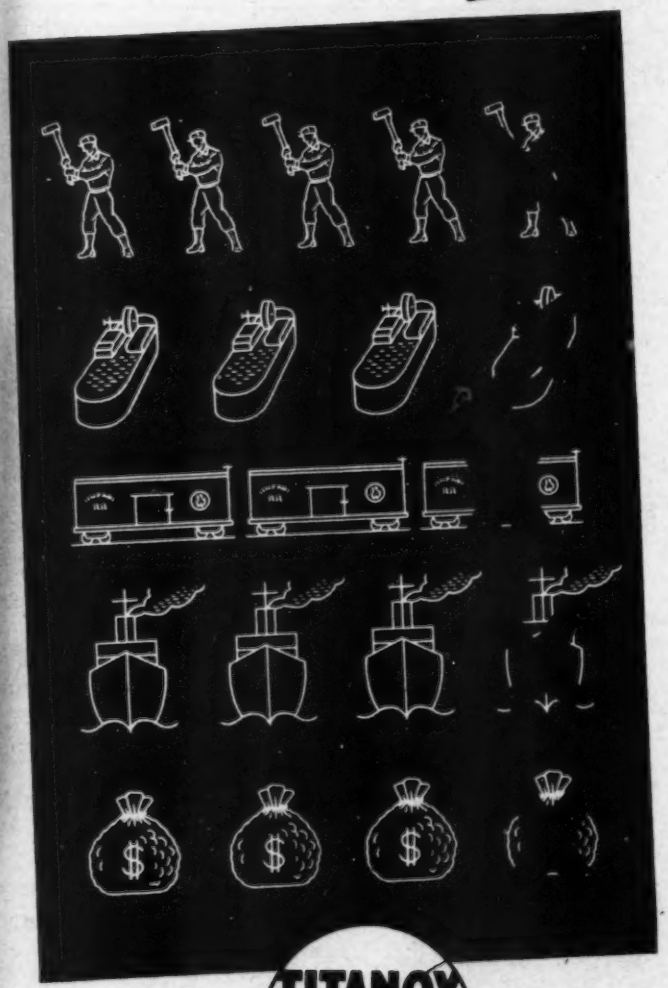

CERTAINLY THE WAR-TIME necessity for light-weight paper stocks to spread out available pulp supplies points a lesson in conservation that profitably can be carried over to the post-war period.

The general acceptance of light-weight stocks by printer and consumer alike may be attributed to the excellent qualities of opacity, whiteness and brightness and the fine printing surfaces imparted to such papers by titanium pigments. Indeed TITANOX, the original and best known of these pigments, has played an important role in minimizing the impact of war-time restrictions on the printing world.

In view of the far reaching advantages deriving from the production and use of lighter weight stocks, such as conservation of manpower, pulp, transportation, mailing costs and the like, manufacturers may well consider carrying many of these lines into the post-war period. Today it is "yardage" as against "weight" in the paper field. Why not project this idea into your plans for the future?

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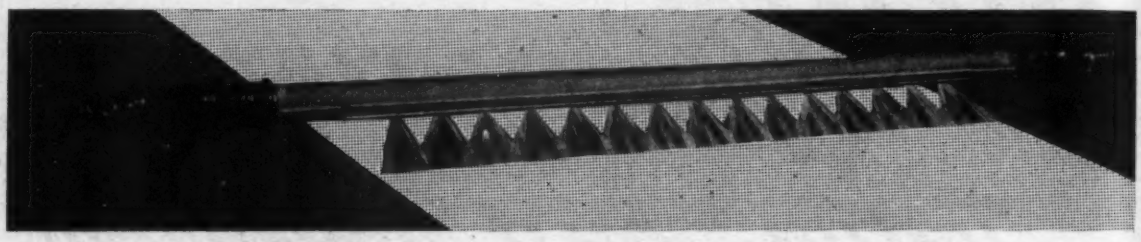

BULLETIN 134 SANDUSKY FOUNDRY & MACHINE CO. Sandusky Ohio

to hungry customers beyond the continental borders in 1944, or 155,000 tons more than in 1943.

Imports

Imports of newsprint paper into the United States were apparently 2,530,000 tons in 1944 as indicated by the mill shipments from Canada and Newfoundland. There was no other source of supply during the year. When official figures are released at some later date by Ottawa and Washington, they may not correspond exactly with those used here because of a frequent time lag.

Consumption

The total and per capita use of newsprint paper in the United States for which satisfactory figures are available during the past 10 years are approximately as shown in the accompanying tabulation (see page 1650).

It will be noted that the per capita dropped to 47.1 pounds in 1944 or the least since 1933. But that is the way the tonnage divides out, using the Bureau of Census population figure of 138,101,000. There were so many people in the services abroad however, that the actual use by those at home must have been quite a little above the indicated average.

Outlook

Like everything else, the whole outlook for newsprint is conditioned by world war and the effects thereof will last for some time after the close of hostilities. For an indefinite period ahead there is an indicated demand for every ton of newsprint that the North American mills will be able to turn out. The demand will be large when the brakes are off and it will take some time for the accumulation of raw material so that the mills can turn out the quantity that a world of people hungry for news will want. There is much bare machine capacity, but that is only part of the story. The cutting and transportation of wood in northern forests takes time even under the most favorable conditions. There will be labor to be recruited and many repairs and improvements to be made in mills which have long been unable to make them. No such crazy situation is in sight after the close of this war as occurred in 1920, but it is obvious that there are busy times ahead.

Which Jobs for Young Workers in the Pulp and Paper Industries?*

▶▶▶ PAPER IS ONE OF the most important and essential products used in the prosecution of the war. Much of the unprecedented demand is for war purposes such as wadding for shells, for packing of materials for overseas shipment, and for use in keeping the all-important records of Americas' millions in the Armed Services. Recognition of the importance of paper has been given through awarding of the Army-Navy E to plants that do an outstanding job in making paper and paper products.

But paper cannot be produced without manpower, and manpower has become increasingly difficult to recruit. In an effort to maintain production, many plants, for the first time, have begun hiring on a full- or part-time basis some 16- and 17-year-old boys and girls for jobs in which previously only adults had been employed. These young and inexperienced workers create a problem that warrants careful attention by their employers—the problem of protecting them from injury.

A safe and healthful place to work must be provided and maintained if young workers are to be employed safely. This requires well-designed buildings, adequate floor space, suitable lighting, and thorough ventilation. It involves good housekeeping such as safe floors, well-marked and maintained aisles, and disposal of scrap. Above all, it means properly guarded machinery and equipment.

Thorough instruction and close supervision, particularly on matters that affect his safety, should be given to the teen-age employee by the foreman. The plant may represent an entirely new environment to the boy or girl who is coming from school without any industrial experience. No inexperienced worker should be permitted to start a job until his supervisor is sure that he knows how to do the work safely and realizes that the safe way is the right way. Being naturally adventurous, a youngster is likely to neglect to use guarding and protective equipment; he may try to lift objects too heavy for him or to clean and oil machinery in motion; or he may indulge in horseplay. If he is not under close supervision he may become overfatigued, and the fatigue may lead to accidents or, if long-continued, may damage his health. He should be given special, individual instruction and assigned to work with an older and experienced worker.

Jobs Unsuitable for Minors

Some work in making pulp and paper is hazardous, much too hazardous for 16- and 17-year-old workers, and in such work minors should not be employed. The safe employment of young workers requires that they be kept away from work that involves exposure to certain specific hazards. Young workers in the 16- and 17-year age group should not, therefore, be employed in the following kinds of work or occupations which usually involve exposure to severe hazards: Work in such locations as:

Inside enclosed spaces such as tanks, vats, pits, boilers, and cisterns

On or around tanks, vats, or tubs unless the side or railing is 42 inches above the working level

In excavations of greater depth than to the worker's shoulder

In the machine shop and the millwright department

About the log pond

On pole or line work

Work around such machines or equipment as:

Open gears, sprockets, chains, belts, pulleys, clutches, shafting, and fans

Unguarded, mechanically operated knives

Saws, splitters, and wood-preparing machinery

Mechanism which controls steam, water, or air under excessive pressure

Unguarded cutting and trimming edges

Nips of any kind

Work involving such processes as:

Repairs or maintenance of electrical apparatus

Construction of and work on stagings

*From leaflet Which Jobs for Young Workers, No. 9, Advisory Standards for the Pulp and Paper Industries, U. S. Department of Labor (October, 1944).

Great Jumpin' Jehoshaphat!

"Thought I'd seen everything 'til I saw my first Hydrapulper the other day. You know, Pete, that thing stood my hair on end. It's terrific. Young feller hurled in a whole bale of mixed stock; stopped to take a chew; and it was ready for another bale. Never saw anything to equal it.

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Thing isn't big—takes very little room and requires practically no attention. But, oh boy, can it handle stock."

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Shartle Bros., Middletown, Ohio
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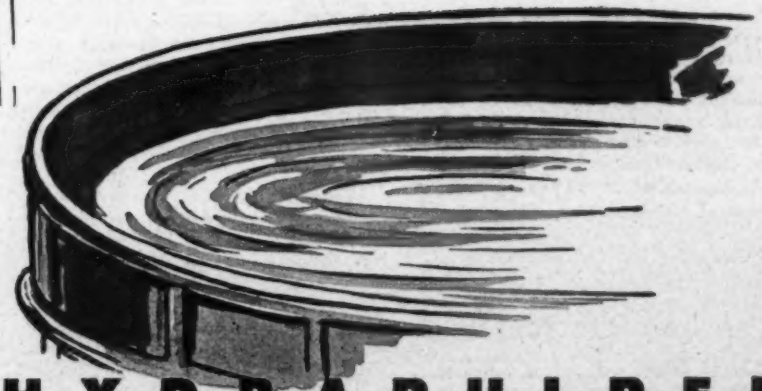

DILTS HYDRAPULPER

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Unloading coal (except hand shoveling)
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Work in connection with cooking processes for waste paper, chips, or rags
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Spray guns
Abrasive wheels (except slow-speed grindstones)
Parchmentizing machines, excelsior shredders, waxing and coating machines
Electrical starting equipment (except when controlled through a low-voltage relay or contactor)
Power-driven cranes, hoists, lifts, or electric trucks

Jobs Relatively Safe for Minors

Some jobs in pulp and paper mills are comparatively free from specific hazards and are relatively safe for 16- and 17-year-old workers. Since the hazards of jobs vary considerably from one mill to another, each job should be studied carefully in the light of local conditions. Minors should be employed only in places that do not expose them to danger and in jobs suited to their strength and physical development. The following are examples of jobs considered relatively safe for young workers in most mills:

Wood-storage yard—Handling of 4-foot pulpwood of small diameter and light weight; tiering and straightening pulpwood either in tiers or on a tiered car when not exposed to overhangs or slides or any overhead equipment such as cranes or buckets; work as clerk, water boy, scaler, sorter, checker; clean-up jobs.

Wood-room—Wood sorting, hand cleaning of wood, and general clean-up work.

Ground-wood mill—Hand handling of blocks, roll skinning, hand trucking, and piling pulp; grinding, if artificial stones are used; cleaning screens; general clean-up work.

Chemical pulpmill—Handling limestone, hand trucking, roll skinning, piling pulp, screen washing, and general clean-up work.

Waste paper recovery department—Sorting, storing, weighing, and handling waste paper by hand; cleaning washers and screens and general clean-up.

Beater-room—Beater helper in feeding stock, broke, or waste paper into beater; stock handler; broke handler.

Machine-room—Such jobs as cleaning, broke handling, and roll plugging can be performed safely by minors providing they are kept away from the machine.

Finishing-room—Helper at rear of rotary cutter; handling paper; sorting, counting, and inspecting sheet paper; wrapping and tying bundles; packing and sealing cartons; wrapping or banding roll paper; sorting and piling sheet paper on skids; wrapping and banding skids; hand trucking paper if the loads conform to size and strength of worker; broke handler; marking rolls, bundles, or skids; checker; paper-drill operator; clerical work.

Storage and shipping divisions—Jobs such as hand trucking, loading bundles, cartons, and skids with hand trucks, and cleaning and lining cars are considered relatively safe.

Laboratory—The routine testing of pulp, paper, white water, and the like present no unusual hazards for young workers although they should not be unduly exposed in the collection of the samples.

When State laws or regulations establish minimum ages for any occupation higher than the ages suggested in this leaflet, the State standards should be observed; also State requirements for employment certificates and restrictions on hours of work and night work.

Historical Highlights of the Hollingsworth & Whitney Company

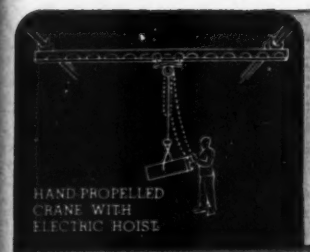
▶▶▶ HOLLINGSWORTH & Whitney Company is one of the oldest papermaking concerns in the United States. For the background of its history one must go back nearly 150 years to the early 1800's.

As early as 1801, Mark Hollingsworth, a father of one of the founders of the present company, operated a paper mill on the Neponset River below Mattapan, near Boston. His sons, Ellis A. and Lyman Hollingsworth, followed in their father's footsteps and each became expert in papermaking, contributing important improvements and new methods to the industry.

Lyman Hollingsworth discovered an improved method for the manufacture of a strong paper by the utilization of waste rope in the manufacturing process. This improved process was mothered by necessity, for Mr. Hollingsworth, being faced with a shortage of stock after the panic of 1837, tried the experiment of cutting the bolt ropes off old sails lying in the mill yard and using this material in the manufacture of paper. The result was a manila paper of great strength and good quality. A patent for this discovery was granted to John M. and Lyman Hollingsworth in 1843.

The Hollingsworth & Whitney Company was established at Boston on April 5, 1862, when Ellis A. Hollingsworth and Leonard Whitney, Jr., formed a partnership for the manufacture of paper and paper bags. Whitney had been operating a paper mill and bag factory at Watertown and Ellis Hollingsworth a paper mill at South Braintree, Massachusetts.

Leonard Whitney produced the first machine-made paper bags in America at Watertown in 1857, on a machine invented by one E. F. Rice of Clinton, Massachusetts. The bags used in those days were made flat, much like an envelope and pasted together by hand. Within the next decade, Hollingsworth & Whitney Company had pioneered the first manufacture of the paper bags formed with a square bottom. This development of the forerunner of the modern "grocery bag" was effected through the purchase of the



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The round arch is an easy means of identifying Cleveland Tramrail. Only Cleveland Tramrail makes ARCH BEAM with true round arches. No other section has the most important feature of ARCH BEAM — the raised wearing tread.

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The beam is arched at regular intervals. It has same strength as similar solid beam.

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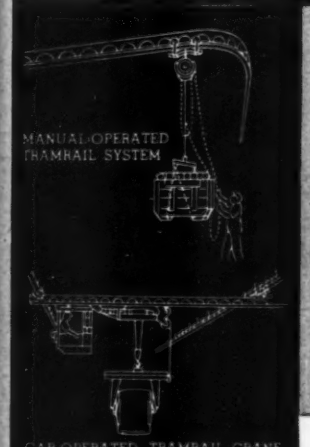

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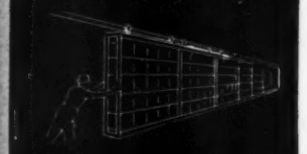

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HAND-PROPELLED CRANE WITH CHAIN HOIST

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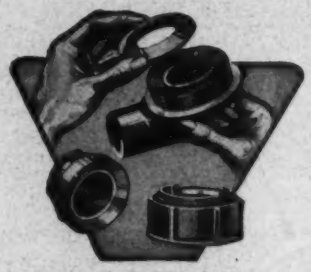

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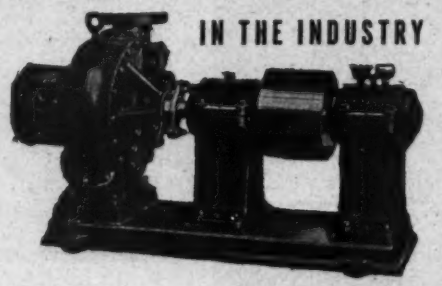

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patent rights of an invention (1872) by Luther C. Crowell. An interesting story connected with this development illustrates some of the unusual incentives for invention. Crowell, when a lad, worked as cabin boy on a sailing ship and was scolded by his captain for not getting the sugar out of the corners of paper bags. Crowell found this censure was unwarranted because of the structure of the bag. In his spare time he pasted up a square bottom bag, and later invented the machinery to produce it.

Wartime products made from Chickasaw mills paper.

Hollingsworth & Whitney, and subsequently their successors, continued the manufacture of paper bags for the grocery and allied trades—along with their manufacture of various standard and specialty papers—up until the year 1925, when the paper bag business was sold out to others.

Charles A. Dean became associated with the company in 1874, as sales manager. In 1876, a mill was purchased at Gardiner, Maine, which was to be the site of continuous operation from that date until 1939.

On April 1, 1882, following the death of both partners, the business was incorporated as Hollingsworth & Whitney Company, with Sumner Hollingsworth as the first president. In that year, Charles A. Dean became vice president and general manager. Under his management the growth of Hollingsworth & Whitney Company was outstanding. The tonnage of paper produced increased from 2,705 tons in 1882-1883 to 54,000 tons in 1911, the year of Mr. Dean's retirement, while in the same period the capital stock was increased from $500,000 to $5,000,000.

Construction was started on the company's large mills at Winslow, Maine, in 1891. Here were built paper and pulp mills. The capacity of this unit was increased under Mr. Dean's direction and that of his successors, W. E. Pratt and M. L. Madden, to a point where 300 tons of paper are produced per day on six

• Basic manufacturing material for the huge North Plant of the Wyandotte Chemicals Corporation at Wyandotte, Michigan, is salt brine. Into this storage tank it pours 24 hours a day every day in the year—from six wells some 1400 feet underground. Daily brine production of this one tank is in excess of 412,000 gallons.

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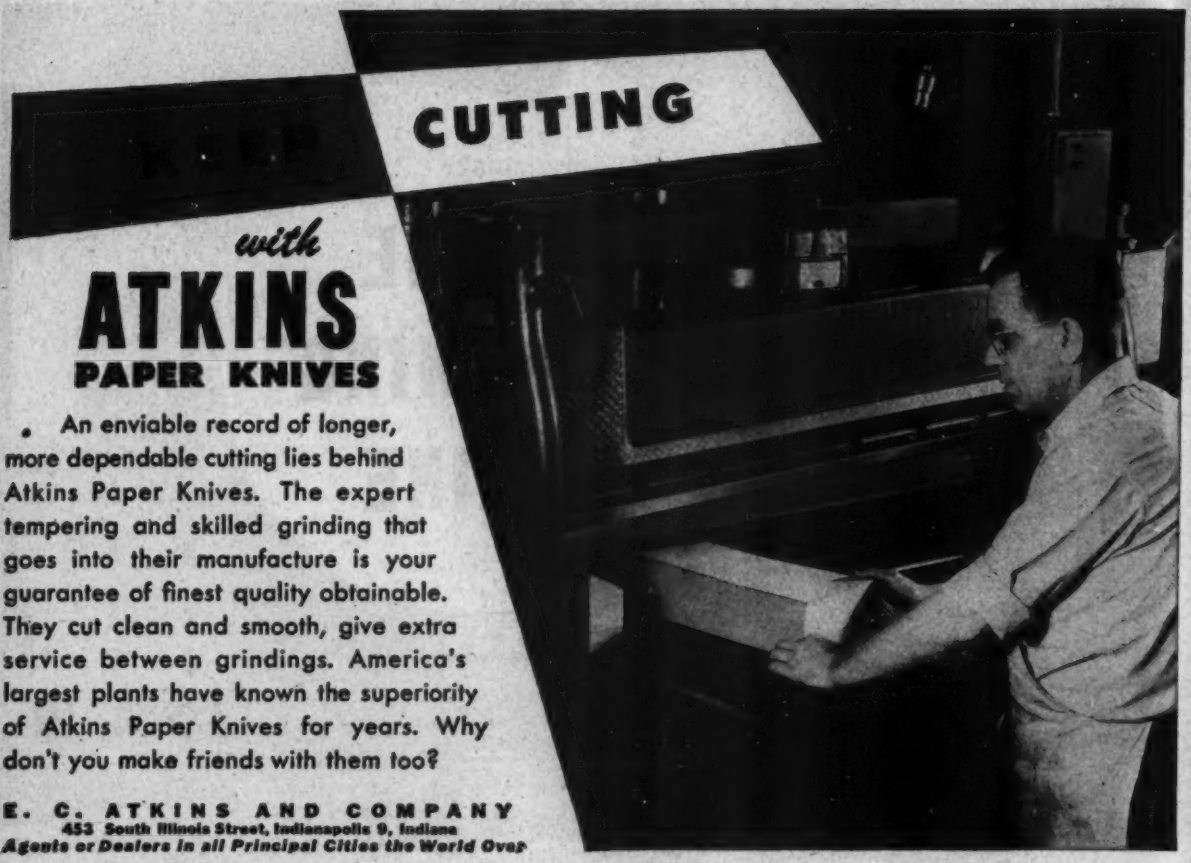

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paper machines, and the daily production of sulphite pulp is 190 tons. The bleach plant has a capacity of 50 tons per day. In 1908, a groundwood mill was built at Madison, Maine, with a capacity of 100 tons per day.

Hollingsworth & Whitney Company's history covers the years of greatest development in the science of paper-making in the United States and this well-established firm has participated in this growth. Its early mills first used hemp stock for raw material, then successively linen and cotton rags, Manila rope, jute, and finally wood fiber, then the chemically cooked wood fiber—sulphite pulp, and in more recent years, sulphate pulp.

OPERATION STARTS AT MOBILE

In its northern mills this company has long held a high reputation in the manufacture of specialty papers for exacting industrial uses. It had developed to a large extent papers which necessitated the use of imported Scandinavian kraft pulp. It soon became evident that the demand for a strong high quality kraft pulp was large and growing. Meanwhile developments and improvement in the utilization of southern pine pulp convinced Hollingsworth & Whitney Company that it could produce these high quality specialty products in the South. Most of the earlier mills using southern pine had been designed to serve the demand for high production rather than quality markets. Following extensive study and research a satisfactory process was selected that assured the production of high quality papers from southern pine, and it was decided to locate a mill in Mobile.

After selection of the present site at Magazine Point, the Hollingsworth & Whitney Company proceeded to design and build mills embodying the latest technical developments in equipment for the production of high quality bleached and unbleached papers to meet the exacting specifications of industrial uses. The Chickasaw Mills (*An extensive description of this plant appeared in the October, 1940, issue of* THE PAPER INDUSTRY AND PAPER WORLD.) include a pulp mill, pulp-drying machine, bleach plant, 184-in. fourdrinier paper machine and 124-in. cylinder paper machine, and all necessary accessory equipment. The plant has a daily capacity of approximately 225 tons of sulphate pulp, both bleached and unbleached.

DEVELOPMENT OF SHELL CONTAINER PAPER

Because of its modern facilities and experience, the Hollingsworth & Whitney Company was called on soon after Pearl Harbor to produce many war purpose papers to exacting specifications. The manufacture of its civilian papers was drastically curtailed in order to take care of the war demands. To effect conservation of the critical metal formerly used in shipping containers, the use of paper and paperboard became increasingly important. One of the problems presented to the organization by the Ordnance Department was that of designing a satisfactory paper container for shipping ammunition to the fronts without damage or loss. Paper containers tried for this purpose up until that time had been found unsuitable to withstand the abuse of shipment and handling. The Ordnance Department asked for a strong, moisture-resistant cylindrical protector. This called for the strongest paper possible.

C. A. Rodden, chief engineer of the company, was assigned to this task. Aided by the company's pulp and paper experts he carried on experiments which led to the development of an ammunition container paper of strength characteristics greater than any previously produced from wood pulp. Tests of various combinations and constructions were conducted in the company laboratories and in collaboration with the Ordnance engineers and the U. S. Forest Products Laboratories to develop the required paper and the design of the actual container. Hollingsworth & Whitney Company engineers also assisted in the design of equipment for testing the ammunition containers.

On view at the Chickasaw mills is a striking display of products of that mill which serve in direct war work. Included in the exhibit are the following war-purpose paper products:

Maintenance made easy with POWELL VALVES

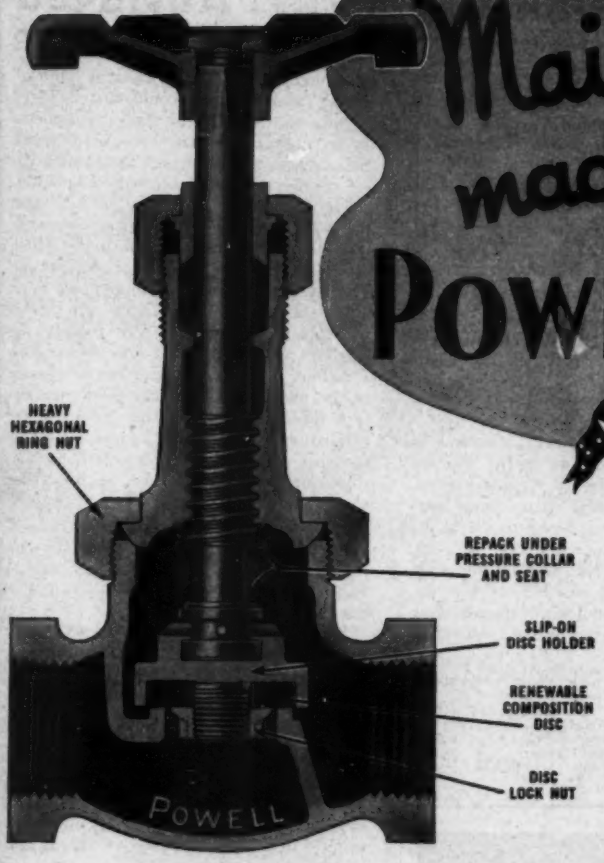

Fig. 150
BRONZE "UNION" COMPOSITION DISC GLOBE VALVE

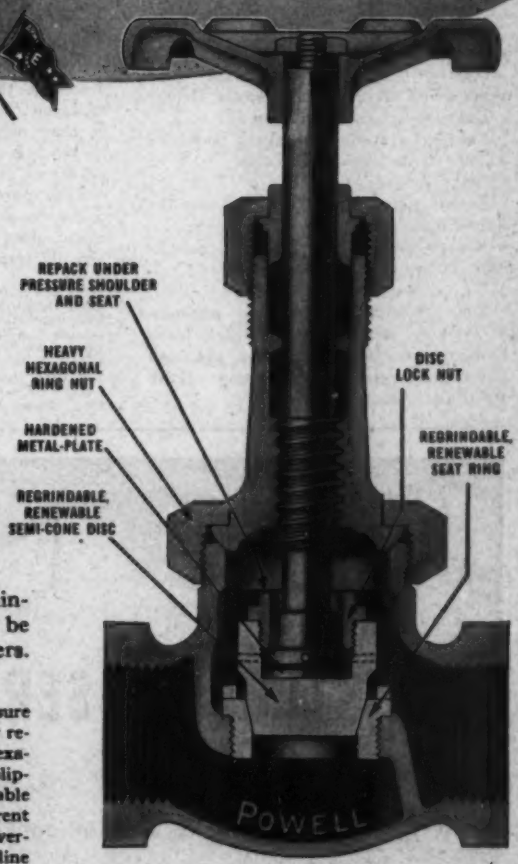

Fig. 1708
BRONZE "WHITE STAR" GLOBE VALVE

In these days of round-the-clock operation, time spent in the maintenance of equipment means a loss in production that can never be made up. If it's flow control equipment, Powell has the answers. Here are two examples.

Fig. 150—a Union Disc Globe Valve—is an economical valve for low pressure steam, oil, water, gas or air. The composition disc can be quickly and easily replaced without removing the valve from the line merely by backing off the hexagonal ring nut, lifting the bonnet assembly out of the body and removing the slip-on disc holder. The discs, especially for the smaller sizes, are readily obtainable and very inexpensive. Discs of various compositions are available to meet different service conditions and the importance of using the *right* disc cannot be overemphasized. The seat can be refaced without removing the valve from the line as indicated above.

For *extra long life*, Fig. 1708 is recommended. The seat ring and disc are made from special hard metal compositions. The hardness of the seat and disc, with their wide contact surface, tends to resist erosion and corrosion over a long period of time. Without removing the valve from the line, seats and discs can be reground to a new tight bearing and, when necessary, new ones can be easily installed. No special tools are required.

All Powell Valves that require repacking are provided with a specially machined cut-off to permit repacking under pressure when wide open.

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Convention Papers . . . Abridged

The abridgments in this section are from papers presented "by title" at the annual meeting of the Technical Association of the Pulp and Paper Industry, held in New York City, February 19, 1945

The Influence of Methylation On the Behavior of Paper Fibers Towards Basic Dyes*—A Contribution to the Mechanism of Dyeing

CHARLES M. SIGVARDT[1]

The purpose of this investigation was to determine the mechanism of the dye attachment of basic dyes to cellulose fibers as they exist in pulp. Basic dyes were chosen because they are used to the greatest extent in the paper industry.

The approach to the problem appeared to be to determine whether or not the acidic groups in cellulosic materials were actually responsible for dyeing. Individual components; i. e., lignin, calcium lignosulfonate, and cellulose could not be used because the isolation of these components in an unchanged state was impossible, although investigation of these materials for confirmatory evidence would be interesting. Therefore, it was decided that the work, with the exception of holocellulose, would be conducted on pulps which are normally employed in papermaking. The dyeing of native, sulphite, and kraft lignins and their methylated derivatives was also included. It was further decided to cover the acidic groups in such a manner that there would be no change in the physical or chemical properties, except those changes resulting from the introduction of methoxyl groups. To accomplish this purpose, diazomethane methylation was carried out in an ether solution.

If, when these acidic groups were covered, the dye sorption power of the cellulosic materials decreased, the dyeing could be ascribed to the acidic groups in the case of basic dyes.

The original wood was normal black spruce, extracted with alcohol-benzene, and washed with hot water. This material probably would have properties very similar to groundwood pulp and was used in this study for that reason.

Isolation of the holocellulose was accomplished by the method which Thomas (PAPER IND. AND P. WORLD, 26:10, 1281, 1945) developed in his investigation of the hemicelluloses of aspen; this utilizes chlorination of wood meal in carbon tetrachloride to remove the bulk of the lignin, with gaseous chlorination (Van Beckum, W. G., and Ritter, G. *Paper Trade J.* 105, no. 18: 127-130, Oct. 28, 1937); *Tech. Assoc. Papers* 21:431-434, 1938) to remove the last traces.

Holocellulose was included in the dyeing experiments to determine what part the carbohydrate fraction played in dyeing, since it contains practically no lignin and nearly all of the carbohydrates of groundwood pulp.

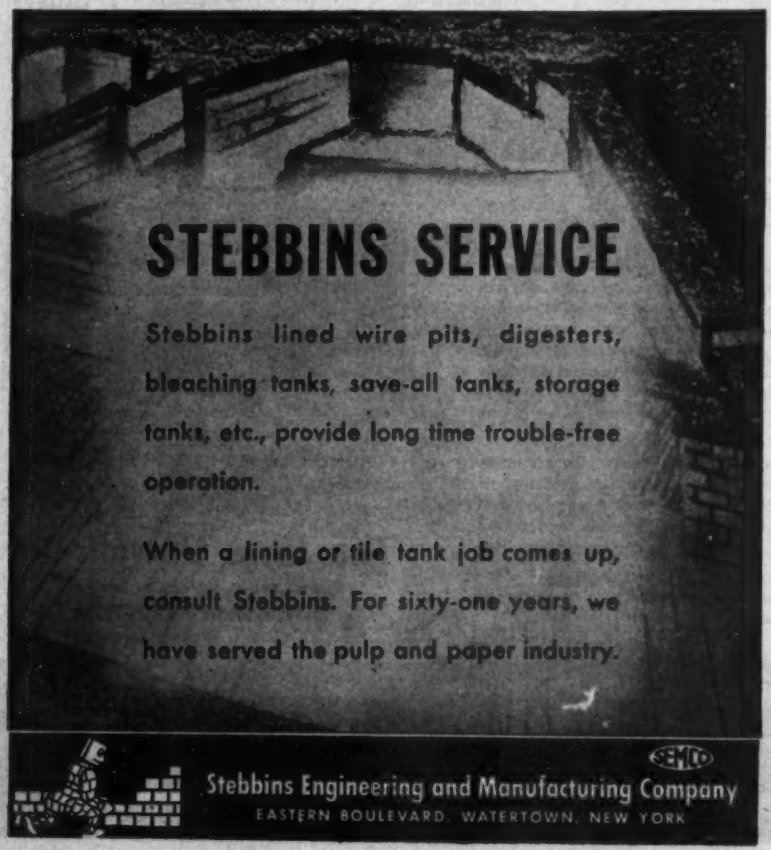
Three sulphite pulps prepared in a pot autoclave represent stocks prepared by three degrees of cooking designed to give pulps of varying lignine contents. Sawdust was used as a starting material to give a maximum of uniformity. The use of three pulps with different lignin contents was intended to show the importance of the lignin in pulp in the sorption of dyes.

Bleached pulp sorbs some basic dye, although in comparison with unbleached pulp the amount is negligible. This pulp, which was prepared by a multistage bleaching procedure to produce a bleached stock with a minimum of degradation, was used to demonstrate that, with practically no lignin present and only small amounts of carboxyl groups in the carbohydrates, dye would still be absorbed.

In order to show the dyeing reaction of carboxyl groups more distinctly, an overbleached pulp was prepared. Similarly, this would demonstrate the effect of methylation more clearly since, with the

*A portion of a thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Doctor of Philosophy from Lawrence College, Appleton, Wis., March, 1944. This work was carried out under the direction of Otto Kress.

(1) Present address, Marinette Paper Co., Glens Falls, N. Y.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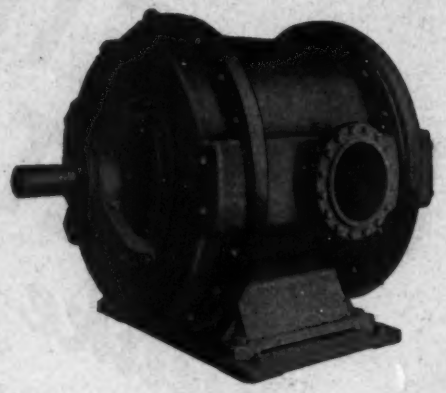

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few carboxyl groups present in bleached pulp, methylation would produce only a slight effect on dye sorption. This pulp was made by use of drastic temperature conditions in order to produce a material relatively high in carboxyl content.

The soda and kraft stocks were included to indicate more clearly the role of the sulphonic acid group of the lignin in sulphite pulp in dyeing. In sulphite pulping, two possible types of groups can be produced: first, the sulphonic acid group and, second, formerly unavailable phenolic hydroxyl groups made reactive by splitting their linkages with the carbohydrates of the wood. In alkaline pulping, only the phenolic hydroxyl groups can be made available. According to Brauns, lignin from alkaline cooking is higher in phenolic hydroxyl content than that from sulphite cooking. Therefore, alkaline pulps having the same lignin content as sulphite pulp should sorb more dye if the sulphonic acid group does not enter into the dyeing reaction. Conversely, if the sulphite pulp does absorb more dye, the sulphonic acid group must enter into the dyeing reaction. These pulps were prepared in a 500-gram pot autoclave, using sawdust as a starting material.

Rag stock which was prepared by the lime-soda process was included to ascertain how a stock which was very low in carboxyl groups would take up dye. This stock was not methylated.

The following cellulosic materials, which had been ground in a Wiley mill to pass an 80-mesh sieve, were methylated with diazomethane in ether because this reagent for methylation, in contrast to dimethyl sulphate, is not likely to cause degradation:

Original extracted wood
Holocellulose
Soft sulphite pulp
Medium sulphite pulp
Hard sulphite pulp
Bleached sulphite pulp
Overbleached sulphite pulp

Seventy grams of moist material suspended in about 600 ml. of ether were treated with diazomethane in an ether solution. (Arndt, F. Diazomethane. *In Organic Synthesis*, Vol. 15, p. 3-5. New York, Wiley, 1935); (Arndt, F. Nitrosomethylurea. *In Organic Synthesis*, Collective Vol. 2, p. 461-472. New York, Wiley, 1943). After each treatment with diazomethane, the material was placed in a refrigerator at 5 C. and shaken occasionally until the yellow color of the diazomethane disappeared, whereupon it was given an additional treatment. Each material was given 25 treatments, at which stage 3 to 7 days of standing were necessary for exhaustion.

Methylations in this investigation were carried out on moist materials (approximately 75% moisture-free) in ether suspension.

In order to determine the change of dye sorption with the addition of methoxyl groups, samples were withdrawn after the 10th, 20th, and 25th methylations and their dye sorption and methoxyl contents determined.

Sulphite and kraft lignins were isolated from their respective pulps by the Willstätter method. The main purpose of investigating these lignins was to obtain evidence as to whether the sulphonic acid group of the lignin in sulphite pulp reacts with dye. Since sulphonated lignin is acid in contrast to thio lignin and alkali lignin, it should absorb more basic dye. After complete methylation, dyeing should still take place in the sulphite lignin, the dye being attached to the sulphonic acid group which is not subject to methylation by this method, since it is present as the calcium salt. However, with thio lignin and alkali lignin, complete methylation should cover all the phenolic groups and dye should no longer be absorbed.

Diazomethane was passed into a cyclohaxonal suspension of these lignins three times. Anhydrous acetone was added and the suspension was centrifuged; this was repeated until all the cyclohaxonal had been removed. The lignins suspended in acetone were given four more treatments with diazomethane (Brauns, F. E., and Hibbert, H., *Can. J. Research* 132:78-87, 1935).

Because native lignin is isolated by an inert solvent, it should not be changed chemically, as is the case with the lignins isolated by strong acids or bases. However, it does not represent the total lignin of a wood, probably differing in that it is not linked to the carbohydrates and is of a lower degree of polymerization. For this reason, it may not react exactly like the total lignin of groundwood but, neverthe-

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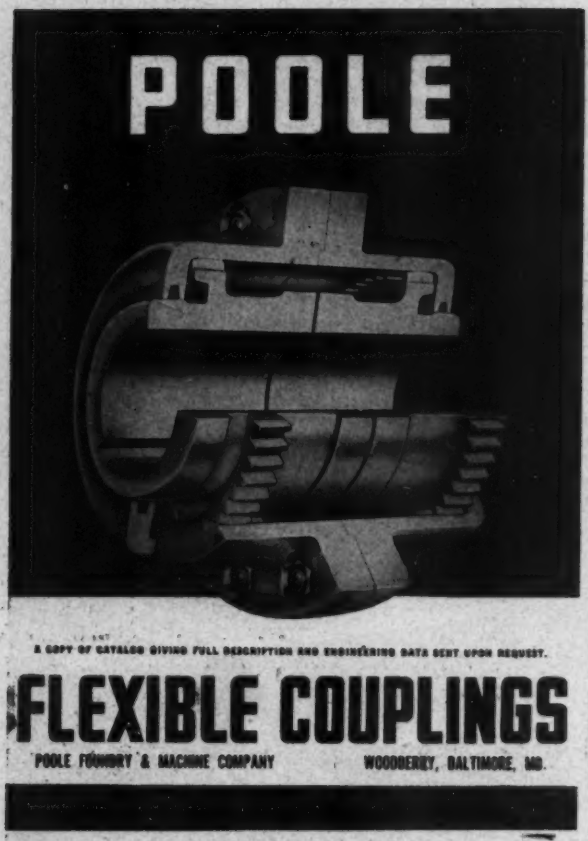
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less, it would serve as an indication of the reactivity with dyestuffs of the unchanged lignin of groundwood pulp and dyestuff.

The native lignin (0.5 gram, which was prepared by the alcohol-extraction method of Brauns (*J. Am. Chem. Soc.* 61:2120-2127, 1939) was redissolved in dioxane and methylated with diazomethane produced by the action of 10 ml. of sodium glycolate on 5 ml. of ethyl *N*-nitroso-*N*-methyl-methane. The methylated native lignin was precipitated into anhydrous ether, centrifuged, washed with ether and with low and high boiling point petroleum ether, and dried in a vacuum desiccator over concentrated sulphuric acid and paraffin.

After the final methylation, the lignins were filtered on a Büchner funnel, washed with benzene, dioxane, and petroleum ether, and finally boiled in water and filtered. They were dyed in this moist condition.

Complete methylation was not attained.

The procedure dropping method for use in determination of dye sorption described and used by Huseman and Weber (*J. prakt. Chem.*, 2, 159:334-342, 1942) consists of dropping dye on a pad of material and sucking the dye through, thereby removing the acid part of the dye molecule as soon as it is liberated. Determinations by this method were made as follows:

One-tenth gram of material was placed in a 3-ml. fritted glass filter tube which was mounted in a suction flask. Dye (0.04 gram per liter) was dropped into the filter tube by means of a separatory funnel, keeping the material covered with dye at all times. The suction was adjusted so that approximately 2 drops of dye were removed per second. In order to prevent channelling, a piece of fine wire was used to stir the material. Dye was added until the filtrate was of the same depth of color as the original dye, after which an additional 25 ml. of dye were sucked through. The total volume of the dyestuff solution added was recorded. The dyed material was washed with about 50 ml. of distilled water, or until the wash water was no longer colored. The combined filtrates from the dyeing and the washing were diluted to a definite volume in a volumetric flask.

Following the method of Huseman and Weber (*J. prakt. Chem.*, 2, 159:334-342, 1942), 0.02 *N* hydrochloric acid was dropped on and sucked through the dyed material in the same manner as in the dyeing. When the acid filtrate was colorless, a few ml. of water were added to wash out the acid. The acid filtrate and the water wash were combined and diluted to a definite volume in a volumetric flask, adding sufficient 0.02 *N* hydrochloric acid to make the concentration 600 ml. per liter.

The following procedure was used to approximate the conditions of commercial dyeings.

One and one-half grams of finely divided material were suspended in 100 ml. of distilled water. Fifteen ml. of dye (0.4 gram per liter) were added and the suspension was stirred for 10 minutes with a mechanical stirrer. Rosin size (3 grams per liter of rosin) equivalent to 2% on the airdry weight of the pulp was pipetted into the mixture and stirring was continued for another 5 minutes, whereupon enough alum was added to bring the pH tot 4.75 $\pm$ 0.1 (a glass electrode was used to determine the pH value). After standing for 5 minutes, the suspension was filtered on a fritted glass crucible and the dyed material was washed with water to a total volume of about 250 ml. The white water (filtrate) was diluted to exactly 250 ml. in a volumetric flask.

In the dyeing of lignin, sufficient dye (0.04 gram per liter) was added to the lignin contained in a centrifuge bottle to make a 10-pound dyeing (1% on the weight of the moisture-free lignin). The lignin suspension was stirred for 10 minutes with a malted milk mixer and allowed to stand for 2 hours, whereupon it was centrifuged, the supernatant liquor was poured into a volumetric flask, and the dyed lignin was washed with water until a total volume of 250 ml. resulted.

All dye solutions and filtrates were measured for their transmittance values on the General Electric recording spectrophotometer. Transmittance values were taken at the wavelength of maximum absorption fr the dye being measured.

From the transmittance value, the concentration in grams per liter could be found by reference to a chart in which log $1/T$ (T being transmittance) was plotted against the concentration in grams

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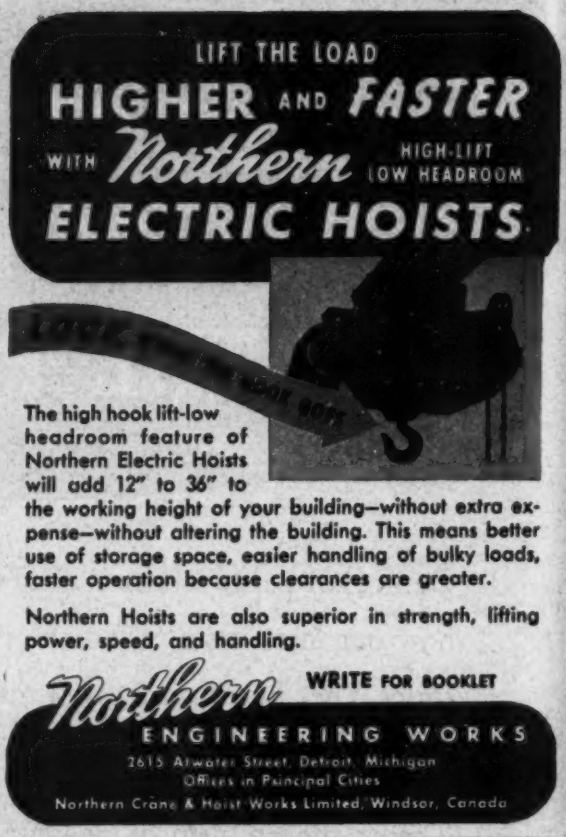
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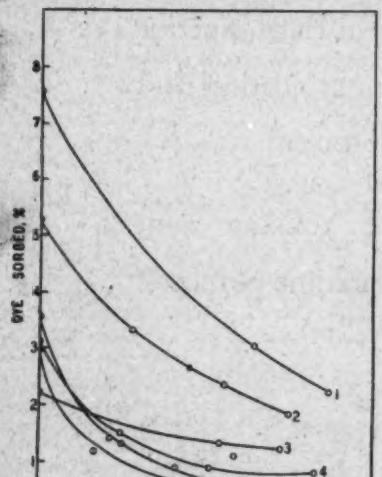

per liter. These charts were obtained by measuring the transmittance values of known concentrations (concentrations of 0.0008, 0.0016, 0.0032, 0.0064, 0.0096, 0.0128, and 0.0160 gram per liter being the standards). Two sets of standards were run; one diluted with water, the other with sufficient 0.02 *N* hydrochloric acid to make the concentration of this acid 600 ml. per liter.

Each day a dyeing was made; one sample to which a definite amount of dye had been added was measured for transmittance. The concentration of this standard was read from the graph and this concentration taken to determine the amount of dye added in the dyeings for that day.

In determining the amount of dye sorbed in the dropping method, the amount of dye added was known and the amount of dye not taken up was found by measuring the transmittance of the filtrate and obtaining the concentration of the dye solution from the standardization charts. By subtracting the amount of dye in the filtrate from the amount added, the dye sorbed was found. The amount released by the hydrochloric acid wash was found by obtaining the dye concentration from the standardization charts. From the concentration in grams per liter, the amount present was calculated.

The amount sorbed in the suspension method was determined similarly. From the standard, the amount of dye added was known. Measurement of the filtrate gave the amount of dye not sorbed by the material. Subtracting these gave the amount of dye sorbed.

In the case of Methylene blue, duplicate determinations were made. Single determinations were made for all other dyes.

In order to obtain a relationship to commercial dyeing, the suspension method was used for all dyes and materials. In this determination, the dye, size, and alum were added in the order given, which is the usual order of addition in mill practice.

The addition of size and alum introduced further complications because the components of the sizing agent (such as rosin size, sodium resinate, and alumina) may act as a mordant and because alum alone will change the pH conditions and shift the equilibrium reaction to the left.

In order to cover the basic dyes as completely as possible, one member from each of the types of basic dyes used in commercial practice was studied. These dyes were Chrysoidine, Rhodamine, Methyl Violet, Safranine, Methylene blue, and Auramine.

In all cases except that of the bleached pulp, the capacity for absorbing dyes decreased sharply upon methylation. The decrease was rapid at first, but became less rapid as more methoxyl groups were added.

The sulphite pulps absorbed dye in proportion to their lignin content. After the 25th methylation, the amount of dye taken up was still decreasing, and the values seemed to be related to their lignin contents, although not as widely divergent from one another as in the unmethylated condition. This would indicate that more acidic hydroxyl groups were preferentially covered in the early stages of methylation. Whether the sorption of these three pulps would eventually go to zero is a matter of conjecture, since calcium lignosulphonic acid groups were still present. Therefore, if they do play a role in dyeing, as later indications show, the curves would not reach zero but would flatten out at a value corresponding to the amount of dye capable of being sorbed by these groups.

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The fact that the sorption values of the three pulps had not become more nearly equal after the final methylation indicated the existence of a group incapable of being methylated which would absorb dye.

Materials containing predominantly carboxyl groups declined quite rapidly in the amount of dye sorbed during the early stages of methylation, then began to level out, and approach the sorption values of bleached pulp. The behavior of bleached pulp was very interesting, in that the addition of 10.50% methoxyl caused very little change in dye sorption in comparison with the large decrease in the case of overbleached pulp which added 7.58% methoxyl. This indicated that alcoholic hydroxyl groups, which were present in approximately the same amounts in both pulps, play no role in dyeing, even though some changes in the physical properties would probably taken place with the addition of such a large percentage of methoxyl groups.

Dye sorption values of Methylene blue ZX o unmethylated pulps indicates that hard sulphite pulp absorbed the largest amount of dye—i. e., 7.6%, with medium and soft sulphite pulps absorbing 5.2 and 3.1%, respectively. Overbleached pulp absorbed slightly more than soft sulphite pulp (3.5%); however, washing with acid released most of the dye (3.0% as compared with 2.2% in the case of soft sulphite pulp), indicating that carboxyl groups, although absorbing large amounts, do not form as stable bonds as those of the lignosulphonic acid. Holocellulose sorbed almost as much dye as soft sulphite pulp, but released it readily when washed wtih acid, as did the overbleached pulp.

Sulphate and soda pulp containing 10.8 and 11.9% lignin, in comparison with 9.68% lignin in hard sulphite pulp, took up much less dye. Hard sulphite pulp absorbed 7.6% or more than twice as much dye as kraft and soda (3.3 and 2.4%, respectively). As mentioned earlier, kraft and soda lignin are believed to contain as much phenolic constituent, if not more, than the lignin of sulphate pulp. Therefore, with approximately equal amounts of lignin, as is the case with these three pulps, kraft and soda pulps should have absorbed at least as much dye. That the carboxyl groups were not responsible, is indicated by the amunts retained after washing with hydrochloric acid. It appears, therefore, that ether groups were responsible, which further substantiates the theory that the sulphonic acid group plays a role in dyeing sulphite pulp by ion exchange of the dye base with the calcium ion of lignosulphonic acid.

The original extracted wood absorbed less dye than the holocellulose. In the case of the latter, practically all of the lignin with its phenolic hydroxyl groups had been removed. Furthermore, some of the uronic acids are no longer present. Meyer (Natural and synthetic high polymers. Translated by L. E. R. Picken. Especially p. 101, 231. New York, *Interscience*, 1942, 690 p.) believes that the most likely linkage between lignin and carbohydrates is through the phenolic hydroxyl groups in the lignin. In the case of carboxyl groups, he postulates that the carboxyl groups form esters with the alcoholic hydroxyl groups of the neighboring cellulose chains. The larger amount of sorption of holocellulose, as compared with the original wood, indicates that the carboxyl groups were linked in some way, either to the cellulose or to the lignin, or that they existed as lactones. Similarly, phenolic groups of the lignin must have been linked in the original wood or a great decrease in dyeing power would have taken place.

The fact that only the carboxyl groups enter into the dyeing of nonlignified cellulosic materials was substantiated by the large decrease in the case of the overbleached pulp and the holocellulose, together with the small decrease in the case of bleached pulp.

Of the sulphite pulps, that containing the largest percentage of lignin decreased the most and the soft sulphite pulp decreased the least.

The original wood decreased in dye sorption considerably upon methylation, although not as markedly as the sulphite pulps. This smaller decrease may have been due to the fact that the carboxyl groups are unreactive toward methylation by existing as the salt of a metallic ion which would not affect a blocking of dye. Further substantiation of this fact may be interpreted from the large amount re-

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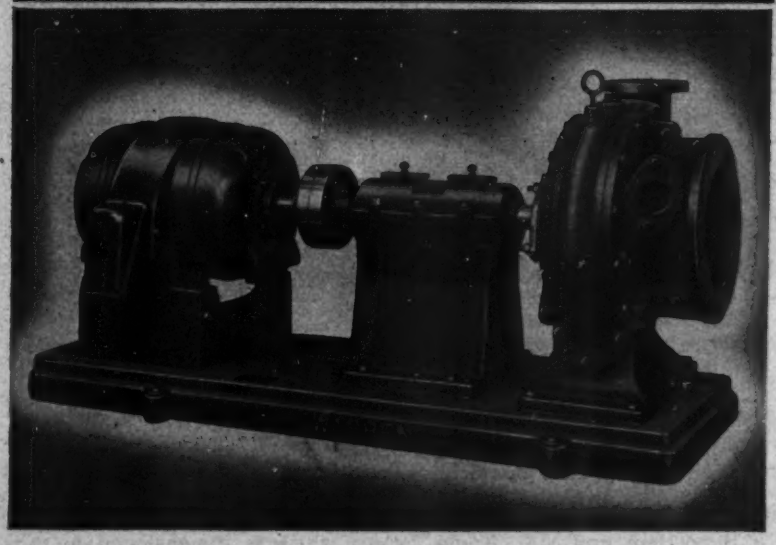

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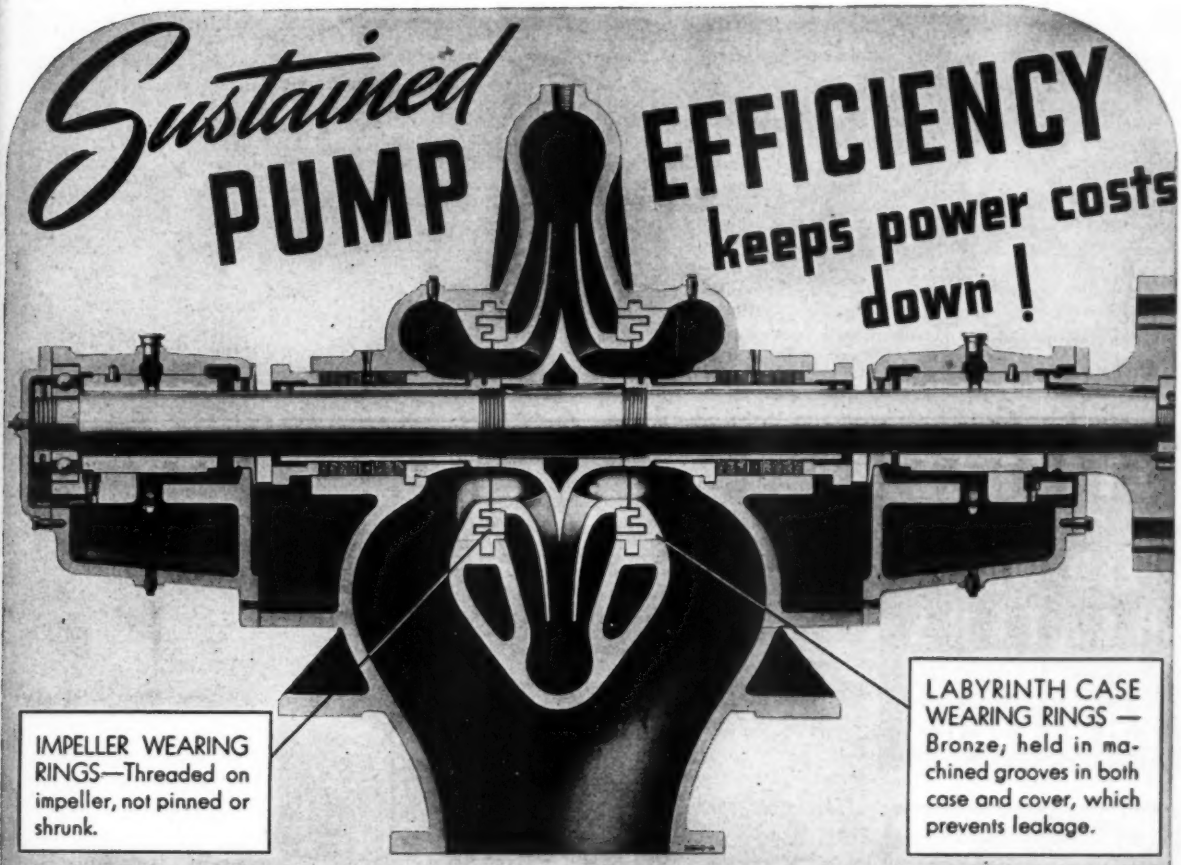
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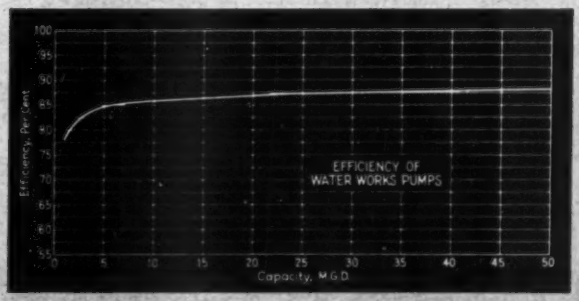

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leased by the acid wash, indicating that carboxyl groups had combined in large proportions with the dye. Thus, in dyeing methylated groundwood, the lignin played only a small role in the dyeing, whereas the carboxyl groups accounted for the greater part of the dye absorbed.

The results obtained with the suspension method were calculated as percentage retention—since this is the customary nomenclature in commercial dyeing—of the 4 pounds (0.4% on the weight of the material) of dye added.

The results obtained with this procedure did not exactly follow those secured with the dropping method. However, hard sulphite pulp was the highest in power of sorption in both cases. The fact that the variations among the pulps were not as great with the suspension method as with the dropping method can be explained by the observation that the ultimate sorption (from dropping method results) was much greater in every case than the percentage retained with the suspension method. With the exception of the bleached pulp and rag stock, the materials dyed were capable of absorbing at least five times the amount added if the hydrochloric acid formed during the dyeing had been removed.

The different order of absorption evident when the two methods are compared was true only when the pulps containing carboxyl groups exclusively and those containing lignin were considered together. Lignified materials as a group follow the general trend as shown below:

Material	Dropping Method Dye Sorbed, (per cent)	Suspension Method Dye Retention, (per cent)
Hard sulphite pulp	7.6	97.5
Medium sulphite pulp	5.2	95.0
Kraft pulp	3.3	95.0
Soft sulphite pulp	3.1	95.0
Soda pulp	2.4	95.0
Original extracted wood	2.1	92.5

Likewise, the nonlignified materials showed a correlation between the two methods:

Material	Dropping Method Dye Sorbed, (per cent)	Suspension Method Dye Retention, (per cent)
Overbleached pulp	3.5	82.5
Holocellulose	2.9	82.5
Bleached pulp	0.4	50.0
Rag stock	0.2	35.0

The fact that the results obtained with both methods do not fall in line when all materials are considered, can be ascribed to the sensitivity of dye absorbed by the carboxyl groups to acid and also, therefore, to the pH of the suspension. The addition of acid may cause a decrease in the ionization of the weekly acidic group of the cellulosic materials as well as an increase in the solubility of the complex formed between the material and the dyes.

An interesting sidelight developed in dyeing by the suspension method from the standpoint of the amount of alum necessary to bring the pH to 4.75.

Enough of the acidity of the material was cancelled on methylation to give a noticeable difference in the amount of alum necessary to bring the pH to the same value.

In the case of the unmethylated lignins, the sulphite lignin retained the greatest amount of dye and native lignin the least. The purity of this sulphite lignin was questionable, since it contained only 4.7% methoxyl (methoxyl is used generally as a measure of purity). Phillips (*Chem Reviews* 14:103-170, 1934) states that lignin isolated by the Willstaetter method is liable to contain cellulose. Assuming the impurities to be cellulose, the retention would be greater if this impurity were removed, provided, of course, that the cellulose was not rich in carboxyl groups. If it did contain a number of carboxyl groups, the methoxyl content upon methylation would probably have increased more than it did—i.e., 2.89%. Therefore, because the sulphate lignin contained at least as many phenolic hydroxyl groups, if not more (as indicated by its greater increase in methoxyl content on methylation), the large absorption of dye by the sulphite lignin shows that sulphonic acid groups do play a role in the dyeing of sulphite pulp.

Further substantiation of the above was indicated by the sorption values after

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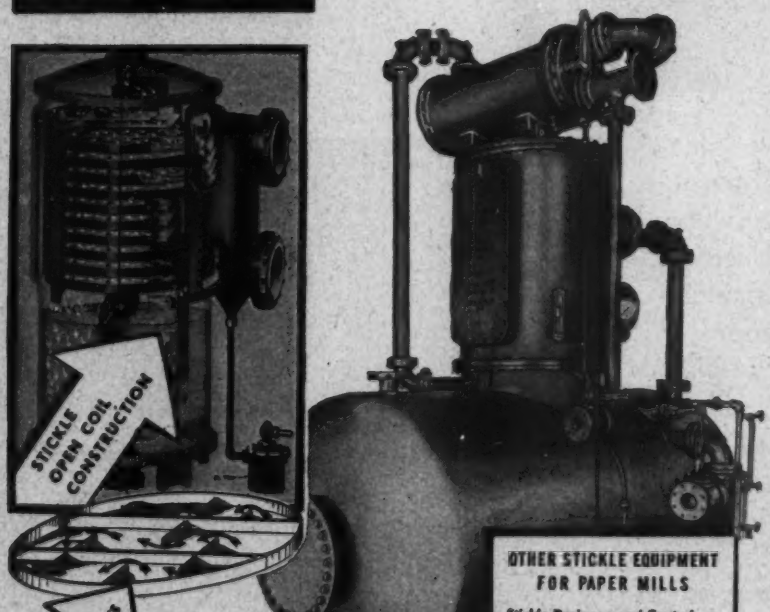

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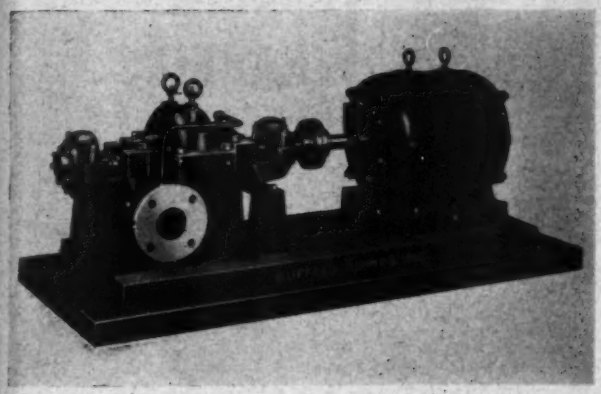

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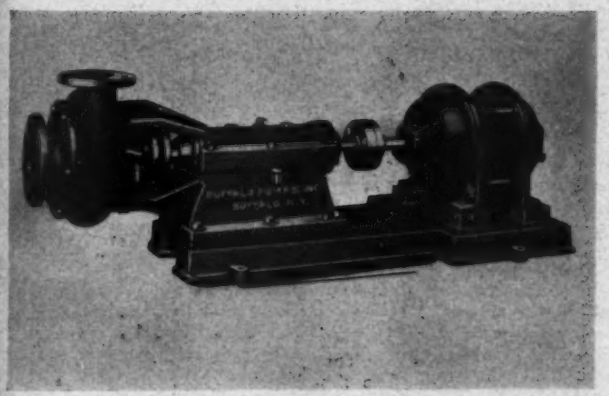
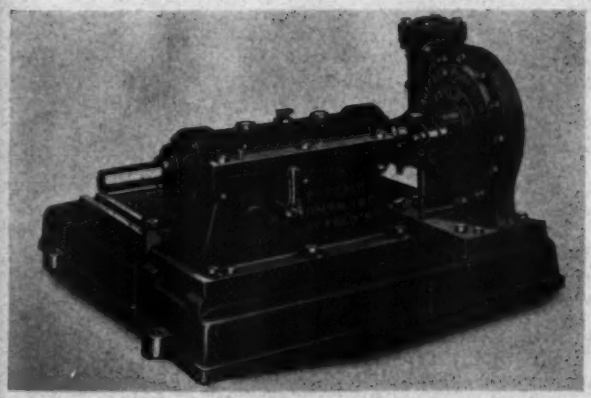


Buffalo Single Suction Full Ball Bearing Pumps are paper mill and chemical plant favorites. Available with open or enclosed impellers, for construction in iron, bronze, stainless steel, nickel, Hastelloy "B" and "C" and other machineable alloys, but not in all lead, these pumps also feature heavy-duty construction for hard service. Stuffing boxes can be modified to suit each particular application, and can be supplied with water seal and also with mechanical rotary stuffing box seals. Shaft is protected from wear by a removable shaft sleeve. Shaft flinger provides additional bearing protection. Full details on these pumps are contained in Bulletin 982.



Buffalo Lead Acid Pumps have enclosed impellers and full ball bearing construction. They are used for hot or cold sulphuric acid, sulphurous acid, alum, ammonium sulphate and copper sulphate. Stuffing boxes are not less than 3" deep, and are made to suit each specific installation. Impeller and pump casing are designed so that even when of all-lead construction relatively high impeller speeds and casing pressures are easily withstood.

While designed primarily for all lead construction, these pumps can also be built in all iron or special alloys. Full details on construction are in Bulletin 982.

Buffalo Pumps, Inc.
213 Mortimer Street **Buffalo, N. Y.**
Canada Pumps Ltd., Kitchener, Ont.

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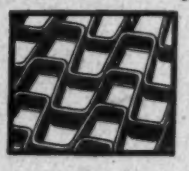

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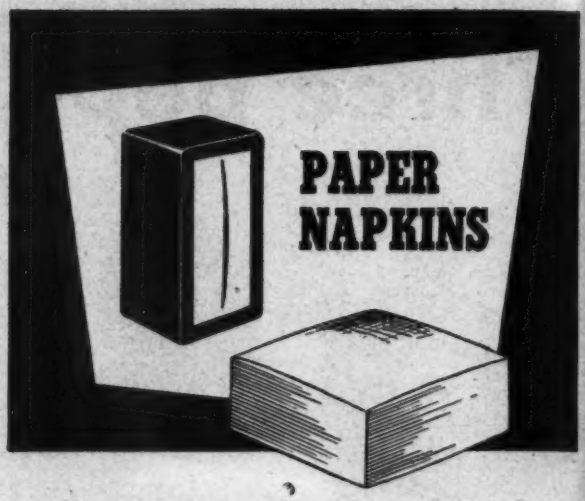

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methylation. In all cases except that of the sulphite lignin, the percentage retention decreased upon methylation. It would seem, therefore, that the sulphonic acid groups in sulphite lignin and also in sulphite pulp are the principal groups entering into the dyeing reaction of this pulp.

Although the dyes did not combine according to molecular weight, it seemed to be of interest to calculate the approximate molecular relationship. Hard sulphite pulp, for example, absorbed 9.6% of Safranine (molecular weight, 350) on the weight of the moisture-free pulp, or 0.027 mole of dye per 100 grams of pulp. In this pulp there was 9.48% lignin. If each lignin structural unit contained one phenolic hydroxyl and one sulphonic acid group (it probably contains less), there would be 0.011 mole of each of these to react with the dye. This value was obtained by assuming a weight of 840 for the lignin building unit. In the carbohydrate fraction, the uronic acid content (expressed as carbon dioxide) was 1.55% or 0.035 mole of carboxyl groups. This last figure undoubtedly included substituted carboxyl groups incapable of reacting with the dye, because analysis by this procedure determines not only free uronic acids, but also lactones formed from uronic acids. A summation of these gives a maximum of 0.011+0.011+0.035 or a total of 0.057 mole of acidic groups to react with the dye. In the case of this particular dye (Safranine), 0.027 mole of dye per 100 grams of pulp was absorbed. Thus, it can be seen that there was an abundance of available reactive groups in the sulphite pulp to react with the dye.

Following is a list of the number of moles of each dye sorbed by 100 grams of hard sulphite pulp:

Dye	*Mole*
Methylene blue ZX	0.025
Safranine T extra	0.027
Chrysoidine	0.014
Methyl Violet	0.019
Auramine	0.017

It should be emphasized again that the amounts of dye taken up by the dropping method were abnormal. An average commercial dyeing to produce a sheet of high tinctorial strength would be 4 pounds or 0.4%; therefore, instead of 0.026 mole of dye per 100 grams of pulp being added, this figure would be nearer 0.001 mole.

With the heaviest dyeings in commercial practice (about 10 pounds per 1000 pounds of stock), only small amounts of reactants in the pulp are necessary, since this amount of dye represents approximately 0.003 mole per 100 grams of pulp. In 100 grams of hard sulphite pulp, for example, there probably exists from 0.02 to 0.05 mole of impurities to react with the dye. The observation that the sorption of the bleached sulphite, holecellulose, and original extracted wood apparently approached a fixed value, although more methoxyl groups were still being added, may be explained by the fact that the carboxyl groups of the cellulosic materials were prevented from being methylated by metallic ions. These metallic ions, though not subject to methylation, could absorb dye by base exchange.

The dyeing mechanism can be ascribed to a chemical reaction of an acid (carboxyl, sulphonic acid, or phenolic hydroxyl groups) with a base (amine group). When the acidic groups (except the sulphonic acid groups) were methylated, the number of acidic groups was reduced; therefore, the number of groups available for chemical reaction was reduced. Further evidence of the covering of acidic groups was inferred from the increase in the amount of alum necessary to bring a dye suspension to a given pH upon methylation of the material being dyed. This mechanism can also be explained from a colloidal charge point of view. The negative colloidal charge may be ascribed to the presence of certain chemical groups (i.e., acid groups). When these acidic groups were methylated, the total negative charge was diminshed and less dye was absorbed.

The Use of Various Papers in Paper Laminates

ROBERT W. BARBER, Chief Engineer, Panelyte Div., St. Regis Paper Co.

A laminated plastic is stronger than the comparable molded product. In a laminate, the reinforcing agent is built up in a predetermined manner and its form is not essentially changed by the molding operation, whereas in a molded material,

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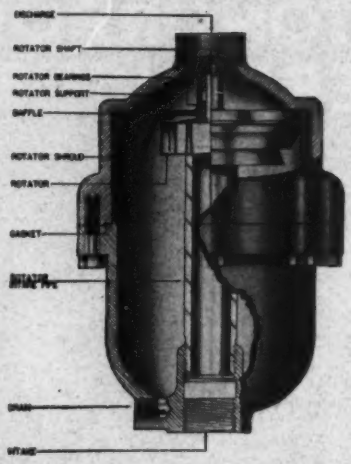

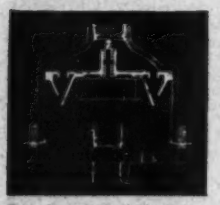

Drawing shows turbo-rotor, shroud and baffles. The design of the baffles precludes the possibility of capillary action of entrainments resulting from high velocity.

THREE MODELS AVAILABLE—A-1 will accommodate volumes from ½ to 5 cu. ft. A-2, volumes from 10 to 35 cu. ft. A-4, volumes from 35 to 100 cu. ft. Multiple units are recommended for volumes above this range. Pur-O-fier is the only standard unit that can be engineered to meet any air volume for regular or intermittent service.

BIRD-WHITE COMPANY
3120 West Lake Street, Chicago, Illinois

to the Mill Supt.

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It can be done . . . and scores of mill superintendents have proved that a little experimenting with different type bars or a combination of types will often pay big dividends.

One example: The superintendent of a Wisconsin unit of a large chain of mills believed, with good reason, that he was not getting sufficient circulation in his beaters. At the suggestion of one of our beater engineers, he removed the straight commercial quality bars he had been using and put in alternate *custom-forged* SWW corrugated and SWW staggered bars.

This change in both quality and type of bars not only brought about the desired circulation increase, but also achieved a marked improvement in the quality of furnish. Indeed, results proved so gratifying that this entire chain of mills is now changing over to SWW *custom-forged* bars . . . straight, corrugated or staggered . . . or some combination of the three types, as individual conditions require.

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SIMONDS WORDEN WHITE CO.
503 Negley Place, Dayton 7, Ohio

the reinforcing agent has no particular structure of its own and must flow with the resin. What little order of structure is obtained is a function of the peculiarities of the piece being molded. The reinforcing agent in a laminate can be controlled so as to conform to a definite design, and it, therefore, can truly be considered as an engineered structure. It is, however, inherently weaker in the interlaminar plane, and, is, therefore, usually restricted to sheets or shapes where the thickness is far exceeded by the other dimensions.

While the phenolic type is the most widely used resin in paper laminates, a word or two relative to other types of resins should be included at this point. The thermoplastic resins, as a class, are all characterized by relatively high molecular weight, and when dissolved, the solutions are high in viscosity. This results in difficulty in handling and in obtaining paper fiber saturation, and for this reason, thermoplastic resins do not find general use in laminating processes.

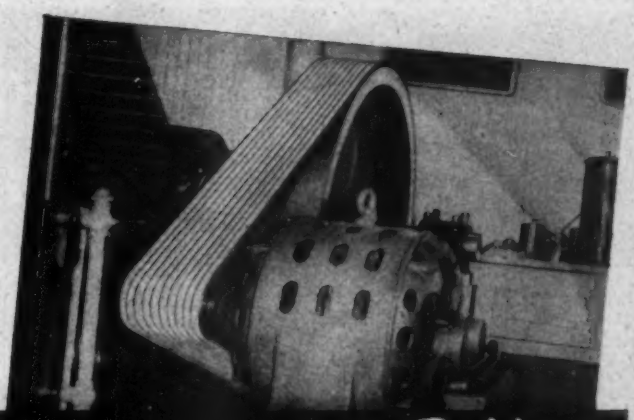
The contact types of thermosetting resins are of low molecular weight and low viscosity in their liquid state. These resins show considerable promise for use in paper laminates. However, they are still quite new and in the development stage and knowledge of their use as laminating resins with paper is not very extensive.

The urea and melamine types of resin are extensively used in laminating. They are, however, inherently brittle and are not easily plasticized. Their use in the past has been for the most part restricted to decorative applications where their water whiteness and stability of color is of primary importance. The use of melamine resins in the electrical field is rapidly expanding, mainly because of their excellent arc resistance.

Phenolic resins are particularly well suited for use with paper in laminating. They can be controlled over a wide range of properties and have good strength characteristics. They readily penetrate the structure of the paper and make hard,

TABLE II—COMPARISON OF LAMINATES

	Mitscherlich Sulphite	Sulphate Kraft	Alpha	Rag	Fabric
Paper Characteristics					
Basis weight (24×36—480), 5% H_2O, lb.	30	93	79	48.5	
Thickness, mils.	3.0	11.0	10.0	7.0	8 oz.
Density, lb./mil.	10.0	8.4	7.9	6.9	cotton
Oil penetration, sec.	2	8.0	3.0	1.8	duck
Gurley Densometer, sec./100 cc.	15	7.0	4.0	7.5	
Type Resin	Phenolic	Phenolic	Phenolic	Phenolic	Phenolic
Resin Content	40%	40%	40%	40%	40%
Physical Properties					
Tensile strength, p.s.i.	30,000	21,000	18,000	16,500	11,000
Modulus of elasticity	2.4×10^6	2.0×10^6	1.6×10^6	1.25×10^6	0.9×10^6
Compression flat, p.s.i.	47,000	45,000	40,000	42,000	40,000
Compression edge, p.s.i.	23,000	23,000	20,000	20,000	20,000
Flexural streigth edge, p.s.i	35,500	28,500	26,000	23,500	19,500
Modulus of elasticity	1.35×10^6	1.5×10^6	1.25×10^6	1.25×10^6	$.65\times10^6$
Flexural strength edge, p.s.i.	35,000	27,000	24,500	21,000	19,000
Izod impact, ft. lb./in. notch					
Flat	4.50	1.95	1.50	1.65	4.5
Edge	.78	.55	.50	.57	3.0
Bonding strength, lb.	850	975	1,250	1,175	1,850
Shear, p.s.i.					
Flat	14,000	16,000	14,500	13,500	12,000
Edge	8,000	10,000	8,000	7,500	9,500
End	8,500	9,000	8,000	7,500	9,000
Water absorption, %	2.6	2.2	1.5	1.4	2.5
Density	1.41	1.40	1.41	1.42	1.35



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strong and well-formed laminates. To simplify the comparison, the data given herein are all based on phenolic laminates.

A paper laminate is a composite structure consisting of a phenolic resin bonding agent and the fibrous base material and combines, in a practical way, the properties of both component parts in much the same way that steel and concrete in reinforced concrete structures support each other. The phenolic resin, which has a low tensile strength, furnishes compressive strength and stiffness, occupies the free space between the fibers of the base, and bonds the fibers and the layers together. The fibers of the base material contribute a major part of the composite tensile strength.

Groundwood and other nonchemically treated pulps are too weak and are generally unsatisfactory as reinforcing agents in laminates.

The types of papers in common use are: sulphite (particularly Mitscherlich sulphite), sulphate kraft, alpha, and rag stocks. On examining the tensile strength figures listed in Table II, it will be noted that these various types of papers decrease in strength in the order named, although there is little difference between the rag and the alpha stocks. This is by no means entirely a matter of the type of pulp used, but is largely influenced by the mechanical structure of the paper itself.

The uses to which paper laminates are put are many and varied. Radio coils are wound on paper laminates. Terminal strips, switch mountings, socket bases, insulating brackets, and many other radio parts are made of paper base laminates. In most refrigerators, the breaker strips in the door frame are of paper laminates, as is the whole inside of the door itself, the insulating parts of the switches, and several parts in the compressor. Automobile ignition systems are to a large degree insulated with paper laminates. Rayon yarn is wound and dried on spools made of laminated paper tubing. Aluminum aircraft parts are formed over jigs made of paper laminates. The armed forces use paper laminates in many ways: in ordnance, chemical warfare, quartermaster supplies, radio, radar, and aircraft. There is scarcely an industry or activity that does not today use paper laminates in some form or other, and the scope of the applications is steadily expanding.

The use of paper laminaes is by no means new, as they are among the older of the various plastics. They have for some time past been standardized throughout the industry, particularly insofar as electrical applications are concerned. Standards are published by N.E.M.A. and A.S.T.M. and are covered as well by various government specifications.

The end, however, is by no means reached, neither as to development of materials and processes, or as to expansion of applications, as both are progressing rapidly. Resin research is active and manufacturers are constantly bringing forth new types of resins as well as improvements of the older types. At the same time, much work is being done in the development of new techniques, particularly along the lines of the manufacture of special shapes or molded laminated forms. It should be the function of the papermaker not only to work towards the developments of papers for the improvement of the quality of laminates, but also to work with the laminator in the development of the papers suitable to the particular molding problem involved.

In summing up, it can be stated that there are many advantages inherent in paper base laminates, i.e., low cost, ease of fabrication by standard machining techniques, high strength in relation to weight, insulating properties, both thermal and electrical, and durability, which makes it ideally suited for applications in many fields.

Paper-Base Laminates for Electrical Insulation

L. V. LARSEN, Plastics Laboratory
General Electric Company

The electrical industry uses a very considerable quantity of paper of many varieties, as components of insulation. In some instances the paper may be applied as such, as for wrapping wires or coils, but mostly it is compounded with some insulating oil or resin into any one of a variety of forms for use in specific applications. One such form is the laminated plastic, which is commonly a combination of a phenol-formaldehyde resin with paper, appearing as a plate, a tube, or a rod ordinarily.

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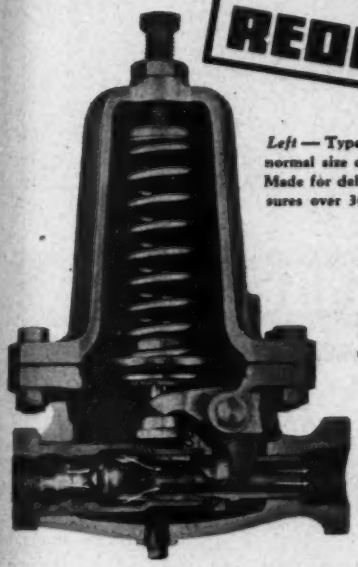
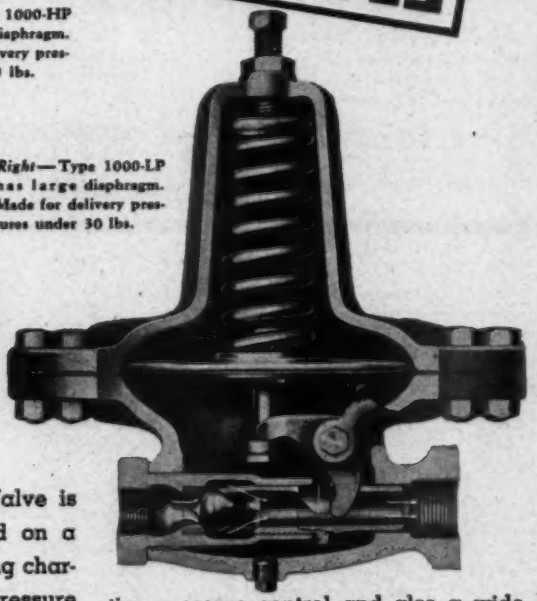


Left — Type 1000-HP normal size diaphragm. Made for delivery pressures over 30 lbs.

Right — Type 1000-LP has large diaphragm. Made for delivery pressures under 30 lbs.



The "1000" STREAMLINED Valve is a performer of top rank, rated on a basis of capacity — tight closing characteristics and close delivery pressure control.

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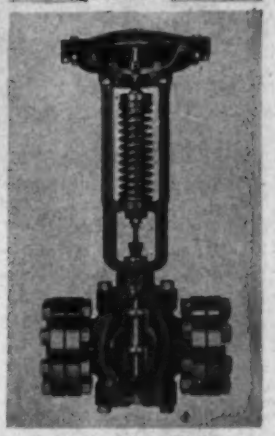

Cash Standard Type 34 Pressure Reducing Valve. For practically all fluids. Has roller bearing, also roller guides that kill side strains and stop packing trouble —no lost motion.

Sizes: ½" to 12" inclusive. Highest initial pressure 800 lbs.; reduced pressure vacuum to 150 lbs. Bodies: iron, bronze, steel. Trim: iron, bronze, stainless steel. Ends: screwed, flanged, ammonia type, welding type. Bulletin 968.

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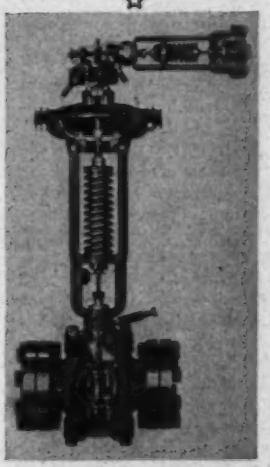

Cash Standard Type 30-AP Valve gives precise control of fluid pressures, through a pilot connected to the pressure under control. For steam, water, air, and most fluids.

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Laminated sheet insulation as made by the plastics industry is largely cloth, paper, glass cloth, asbestos cloth, or asbestos paper bonded with a phenolic resin almost universally. In general, the paper base laminates are found to furnish laminates of the best electrical properties and by proper choice of the grade of paper and the resin some particular property or group of properties of the finished laminate may be emphasized.

For example, by using a good grade of sulphate kraft with an ordinary phenolic resin or more properly phenol-cresol formaldehyde resin, a laminate characterized by moderate electrical properties, as dielectric losses, very good dielectric strength, and very good mechanical strength may be obtained. If the resin content is on the low side, around 30 per cent say, the moisture absorption is found to be high, and the value as insulation is very poor when wet. However, this low resin content makes for higher mechanical properties, as tensile or impact strength. Conversely, if a high resin content is used the fibers are impregnated and protected much better and the wet electrical properties improved, but at the expense of the mechanical strength.

The laminator uses kraft paper to a considerable extent for many of the insulation demands. He requires a very uniform sheet, of good absorbency, good strength, and accurate tolerance on caliper.

Kraft paper alone, if made of good pulp, has many uses in insulation as it has good dielectric strength and low power factor and dielectric constant. The addition of the phenolic resin stabilizes the moisture absorption tendencies of the paper, however, and make it a much more reliable insulator.

The high mechanical strength of kraft paper is put to good use in the manufacture of laminated tubes. For this use thinner paper is used than for the sheet stock, but otherwise the requirements are similar.

Most paper-base laminated stock is fabricated in a punch press, the millions of small parts used for spacers, washers, coil forms, tube base supports, and the like being very economically turned out by that means. In order for the laminated sheet to punch properly, it must be softer and more resilient than for sewing or shearing. The punch grades of paper base may be made from kraft paper with a plasticized phenolic resin, but better grades are made with rag paper.

The rag papers, or other high alpha papers, give the best electrical properties for radio insulation. Here the dielectric loss factor, as measured by the power factor and dielectric constant, must be kept at a minimum and the laminate must not be sensitive to water. The ordinary phenolic resins are not quite good enough for these grades and customarily an aniline-formaldehyde type of resin must be used.

The electrical properties of a paper-base laminate are largely reflected in the choice of the resin used. The class of water soluble phenolics seem like very useful impregnating varnishes because they pair high resin content with low viscosity, and relatively dense papers can be treated with ease. These resins, however, by virtue of their composition necessary to make them water soluble give electrically poor laminates. They also tend to be brittle. However, as these low viscosity resins do a better job of impregnating the micelles of the cellulose than do other resins, the finished laminate has superior resistance to water, and is dimensionally more stable under humid conditions.

Spirit soluble phenolic resins have a considerably higher viscosity for comparable resin contents, consequently thorough impregnation of the fibers is more difficult, and the laminator likes to use an uncalendered, absorbent sheet. Much of the resin content of the individual sheets which will be pressed to finished laminates is on the surface and is driven into the plies in the pressing operation. These spirit soluble resins are electrically very inert, and the skilled laminator can use them to build up dielectric strengths of the order of a thousand volts per mil with a power factor of the order of 0.03.

Surface arc resistance is often important, for instance in insulation adjacent to switches or relay points. The phenolic resins do not furnish very good arc resistance, as brief exposure to an arc causes carbonization in the arc path, leading to a breakdown. Where resistance to arcing is important, the phenolic laminate may be given a coat of a Glyptal alkyd resin varnish and good protection is afforded. If the

Longer wearing contact surfaces, minimum amounts of shrinkage and stretch plus a high degree of porosity which result in lower steam consumption are all factors which have given RICHLAND TRIPLEX a pre-eminent place in the minds of dryer felt users. For felts that provide a maximum wear with a minimum in production delays, specify RICHLAND TRIPLEX, all cotton, heavy duty dryer felts.

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paper-base laminate is made with a melamine resin, or a urea resin, instead of the phenolic the surface arc resistance will be quite high, of the order of 125 seconds as compared with less than 10 for the phenolic. The aminoplast resins (urea and melamine), however, do not give a favorable balance of properties and are seldom used in electrical grade laminates. Their big use is in the manufacture of nameplates and related types of laminate.

For a cross section of the requirements for papers some specifications are examined:

For kraft paper:

Width, inches	38
Thickness, inch	0.0102–0.0118
Air resistance, seconds per 400 cc.	8–16
Oil penetration, seconds	3–5
Absorbency, min.	20
Color	Natural
Wet tentile	
MD, ounce min.	17
CD, ounce min.	9
Moisture, % max.	6
Ash, % max.	1.0
Acidity	Neutral

As shown above, this kraft is a general purpose filler stock, which can be used for ordinary grades of insulation, mechanical properties being very good.

For a bleached sulphate paper:

Width, inches	38
Thickness, inch	0.0102–0.0118
Air resistance, seconds per 400 cc.	8–16
Oil penetration, sec.	2–5
Color	White
Wet tensile,	
MD, ounce min.	60
CD, ounce min.	40
Moisture content, % max.	6
Ash, % max.	1
Acidity	Neutral

This paper is used where a higher quality of electrical insulation, as regards dielectric losses, is concerned. It is also used in making tubes, though in thinner stock ordinarily.

For a high-alpha paper:

Width, inches	38
Thickness, inch	0.0038–0.0042
Air resistance, seconds	85–100
Oil penetration, seconds	4–6
Wet tensile	
MD, ounce min.	38
CD, ounce min.	39
Moisture, % max.	6
Ash, % max.	1
Acidity	Neutral

This paper is used in making tubes for high dielectric strength applications, and elsewhere where superior electrical properties are required.On a number of the paper base laminates, the outer face sheet is often made of a high-alpha cellulose content paper which is colored.

Representative laminates made from some of these papers have properties as follows:

Filler	Kraft	Bleached Sulphate	High Alpha
Dielectric strength, S.T.O., v./m.	800	885	850
Moisture absorption, %	3.11	1.53	0.78
Power factor, mc.,			
dry	0.046	4.040	0.034
wet	0.052	0.046	0.038
Diel. const., 1 mc.,			
dry	5.8	5.0	5.0
wet	6.0	5.4	5.0
Loss factor, 1 mc.,			
dry	0.27	0.20	0.17
wet	0.31	0.25	0.21
Tensile,			
lengthwise, psi.	20,600	14,500	13,100
crosswise, psi.	16,000	11,100	10,500
Flexural,			
lengthwise, psi.	21,700	23,500	19,300
crosswise, psi.	22,200	18,900	18,400
Izod impact, per in of notch, ft. lb.	2.5	3.9	2.7

It will be noted how good electrical properties are obtained, in general, at the expense of mechanical properties. It is for this reason that a number of grades of laminated paper base are manufactured, so that practically any single desired property may be offered, with a fair balance of the other properties.

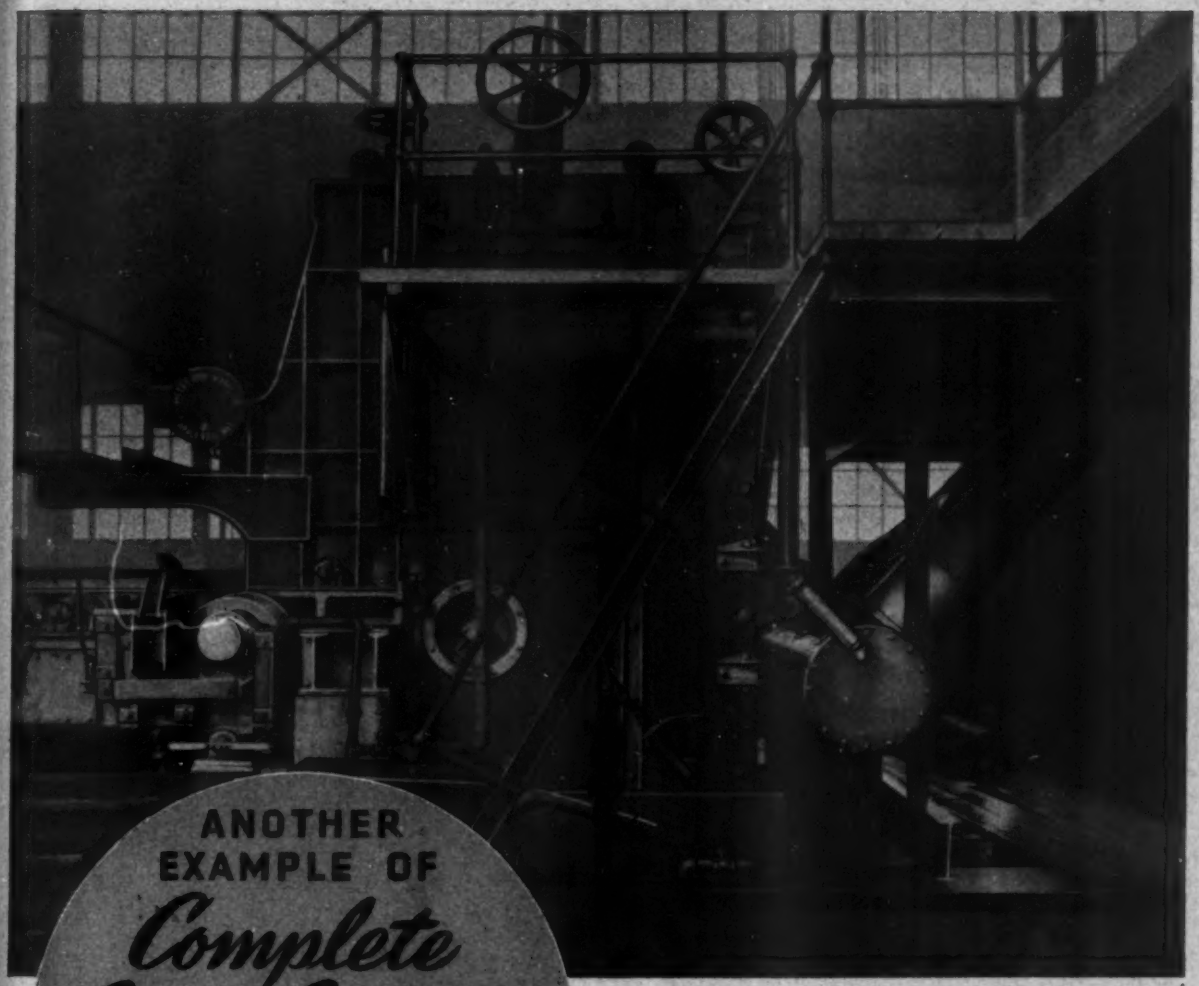
The Operation of Rotary Lime Kiln in a Sulphate Mill

E. A. HARPER, Technical Director, Brunswick Pulp and Paper Co.

The purpose of this paper is to describe in some detail the operation of a rotary lime kiln. The general procedure of operation and controls on this lime recovery system may be applied to any mill using a rotary kiln for the recovery of lime from the causticizing process. The average results, tabulated in this paper, are from the operating and laboratory statistics. It covers a period of approximately one year of mill operation.

The mill is equipped with one Allis-Chalmers rotary lime kiln-oil burner (130 feet long, 7 feet in diameter), with a rated capacity of 35 tons per day. The chain section is approximately 21 feet, beginning back 4 feet from the feed end.

The kiln is lined with 6-inch bricks as follows from the discharge and back: 2 feet of H & W Crown, 5 feet of Anchor, 25 feet of Alusite, 5 feet Anchor, 58 feet of H & W Crown, and 25 feet of Wylam. On an average, the lining has been in service for a period of one year, with the



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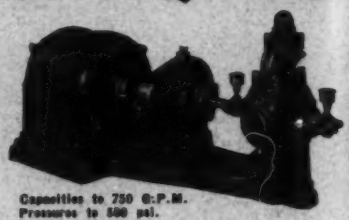

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exception of 12 feet in the middle section of the kiln, which is lined with H & W Crown, has been in service for 1.5 years.

In order to establish and maintain a uniform quality product at a maximum production rate, it is vitally important that this operation be equipped with proper controls such as fuel oil temperature control and temperature recorder, oil pressure regulator valve, fuel oil flow meter, induced damper control (motor operated), induced and forced draft indicators, flue gas temperature recorder, lime temperature recorder, mud sheet thickener indicator, and kiln speed regulator.

In our installation, in order to obtain the most satisfactory kiln operation from the standpoints of quality and quantity of lime, it is believed that it is necessary to maintain the following condition:

1. The chain section temperature of approximately 450 Fahr. and a lime temperature between 2,000 to 2,200 Fahr.

2. The mud feet rate to the kiln should be held as constant as possible, with a consistency of approximately 55.0 per cent (moisture-free basis).

3. The kiln speed (rpm) should be controlled by the amount of lime produced. For our kiln, the following relationship between kiln capacity and kiln speed is suggested:

Kiln Capacity Tons/day	*Kiln Speed RPM*
0.30	0.45
31-40	0.60
41-50	0.90
51-60	1.20

One of the principal problems confronting the lime recovery operation is the formation of rings in the kiln. As is known, a ring is a doughnut like formation somewhere near the midsection of the kiln formed by adhering of lime to the walls of the kiln at that point. As operation proceeds, the ring either falls out or builds up to such an extent that production is impaired. The tendency for ring formation in a lime kiln appears to be a function of the ratio of surface to mass, which ratio is, of course, a function of particle size. In other words, the larger the particle size at the point of the ringing zone less will be the tendency for ring formation.

The wet sludge, as it dries out, forms two things, dust and pellets. The pellet size will not adhere to the walls of the kiln, while on the other hand, dust will invariably do so if, in proper contact of the wall at the proper temperature.

The calcium carbonate sludge fed to a lime kiln contains varying amounts of alkali. The amount may be varied widely by varying the degree of washing. For satisfactory operation, it is believed that the soda content in the sludge should be as low as possible, not over 1.0 per cent as Na_2O. Lime sludge, with a high soda content is poor practice as this has tendency to both form rings and leach out the kiln lining.

Free lime in the sludge seems to influence the ringing characteristics. In general, it is safe to say that free lime, even in small amounts, will help to increase the proportion of pellets formed, which fact is indicated by a slight reduction in dust carry-over, as shown by the amounts of dust collected in the stack dust chambers. It must be remembered, however, that carrying an excess of free lime in the sludge increases the oil consumption and reduces efficiency.

Table I—Average Operating Results

Forced draft	0.05 to 0.03
Induced draft, inches H_2O	5
Damper opening (per cent)	67
Chain temperature (deg. Fahr.)	475
Lime temperature (deg. Fahr.)	2055
Oil temperature (deg. Fahr.)	235
Gallons oil, per ton lime	75
B.t.u. per ton lime	11,250,000
Oil lime pressure, lb. gauge	78
Moisture in filter cake (per cent)	45.0
Filter cake thickness, inch	0.75
Tons lime per hour	2.43
Calcium oxide, content (per cent)	88.1
Slaking time, minutes	2.667
Settling rate, 50 per cent	1.55
Soda as Na_2O, per cent	1.23
Free lime in sludge (Moisture free, per cent)	3.31

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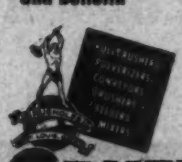

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Chemical Defoamers in the Manufacture of Pulp and Paper

WALTER B. MOREHOUSE, Manager
Paper Chemicals Division
National Oil Products Co.

Throughout this paper, the word *foam* is employed in its general sense, and as such is intended to cover entrained air, froth, and air bubbles, all of which may be encountered by the pulp and paper manufacturer.

It is believed that the causes of foam may be fitted into two general categories: (1) mechanical and (2) chemical. Mechanical foam usually results from improper equipment design or, more generally, from operating machines at speeds in excess of the speeds for which they were originally designed. Chemical foam is caused by chemicals used in the process which tend to change surface tension or to produce foam by chemical reaction between products added to the furnish. Troublesome foam in the pulp and paper industry is usually a combination of chemicals *plus* mechanical action. It is believed that in almost all cases, when foam is present, even in small amounts, it interferes with sheet formation and should be eliminated.

In peace-time, the majority of mills which ask for help on foam problems have

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trouble caused by mechanical design. In wartime, it is often found that the foam is caused by chemicals added; e.g., rosin size, chemicals already present, or because of the use of low grade wastepaper. Of the two, mechanical foam is ordinarily easier to control and, in some cases, careful pH control is helpful in eliminating it. However, on chemical foam, one is not always able to materially alter existing pH conditions. Also, in controlling chemical foam, great care usually must be exercised as to the type of foam killer selected as well as the amount necessary to do the job. In some instances a foam killer may upset phase equilibrium to such an extent that when used to control foam on hard sized grades, it partially nullifies the waterproofing imparted by the rosin size.

Foam problems may be further divided in reference to pH conditions of the furnish. Usually, a material which will defoam a stock at a low pH will be relatively ineffective at a high pH. It has also been found that conditions in a soda pulp mill require a different group of products to eliminate foam than when a similar problem arises in a sulphate pulp mill even though pH conditions may be alike. Furthermore, the product which is effective in either place may not prove helpful on the paper machine.

Many times, foam in the acid towers causes costly delays in the acid making cycle. Foam in the rifflers, screens and washers may lower the capacity of this equipment. However, the most serious consequences of inadequate foam control occur at the paper machine.

When a machine tender is running a sheet which tends to foam and he does not use or have available an effective defoamer, he may find it necessary to:

1. Run the machine slower.
2. Reduce the volume of water through the fan pump-machine cycle, which in itself may harm formation.
3. Increase the volume and velocity of the cold water spray showers which may be helpful in reducing foam but in turn sends the sheet to the driers at a lower temperature which may mean an increase in steam consumption per ton of product dried.

Since there are so many foam preventives available, how does one go about choosing the right one for a particular foam problem?

As a starting point, a mill might secure 5 gallons, or even a barrel, of a foam killer from some reliable supplier and give it a trial on a mill scale basis. The usual practice is to make a very dilute emulsion using 5 to 10 pounds of defoamer in 50 gallons of water. This serves as a stock emulsion and is dripped into the paper stock at some convenient point; e.g., machine screen, machine headbox, or fan pump. Almost invariably it is the preferred procedure to add a defoamer as close as possible to the point at which the sheet is formed, provided good mixing with the stock is obtained. Foam which occurs in the beater and machine chest is seldom troublesome to the point that it must be controlled. However, there is often enough foam present at these points to partially consume a foam killer which has been added at this point in the stock preparation cycle.

If the above procedure fails to give results, it is suggested that a reliable company which specializes in foam control be called in for consultation and advice. It should always be remembered that the best suppliers of defoamers may not be able to solve the problem except after careful study of all the conditions involved, and may even then fail.

Throughout a trial the product should be carefully checked to determine if it

(Concluded on page 1690)

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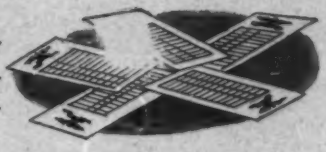
c—Attractive, handy War Bond envelopes, enabling Bond holders to note each separate purchase—and the specific purpose for which each Bond or group of Bonds was bought.



Passing this particular ammunition requires that you reappraise your own company's Payroll Savings Plan. Have your own War Bond Chairman contact the local War Finance Committee—today! They will welcome the chance to discuss this new program with you.

The Treasury Department acknowledges with appreciation the publication of this message by

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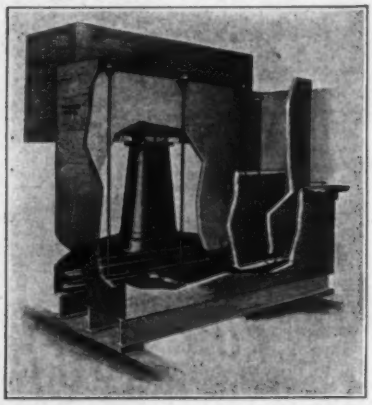
NEW EQUIPMENT AND SUPPLIES

Fourdrinier Flow Spreader

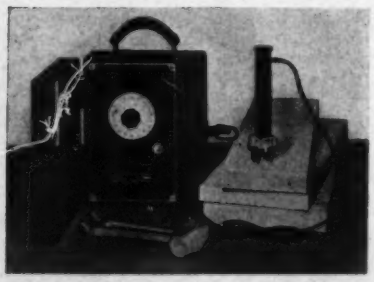
D. J. Murray Manufacturing Company, Wausau, Wis., has announced a flow spreader for fourdrinier machines. The unit is of all copper and bronze construction. It is furnished separately to install between an existing surge box and existing



head box, or with a head box as a complete unit to install on a paper machine. The advantages of the flow spreader, as cited by the manufacturer, are: high efficiency, reduced head loss, maximum flow from screens at lowest levels, and increased paper machine speed without raising the screens.

Moisture Detector

Colloid Equipment Co., Inc., 50 Church St., New York, N. Y., has announced the *Delmhorst Moisture Tester* for use in making rapid moisture determinations of wood and other materials. It is used by forcing the electrode needles (see illustration) into the material being tested. Then the read-



ing is taken by simply turning the dial knob until a small light above the dial flashes at the moisture content.

The instrument covers a range of seven to 25 per cent moisture; and, according to the manufacturer, is accurate within one per cent.

Electronic Temperature Recorder-Controller

Bailey Meter Co., 1050 Ivanhoe Road, Cleveland, Ohio, has announced an electronic type resistance thermometer suitable for indicating, recording and controlling temperatures between minus 100 Fahr. and 1000 Fahr. This recorder operates on the null balance principle and provides balancing action by electronic detection unit control.

The thermometer may be provided with as many as four recording pens, each one being provided with its own continuously connected electronic control unit and measuring bridge.

The temperature sensitive element is a platinum resistance wire, wound on a mica form and held between two mica sheets which are clamped by a metal frame. The element is further protected by a well which is permanently installed in the pipe line, furnace wall, duct, or other point of temperature measurement.

Air-operated control, electronic control, or contacts for on-off electric control may be provided for as many as two temperatures by the multiple pen electronic recorder-controller. The control mechanisms

are mounted inside the recorder-controller casing and are actuated by the same reversible motors which drive the recording pens.

Alarm contacts may be provided for any or all of the recorder units. These contacts are operated by an adjustable cam which may be set to trip at any desired position of the recording pen.

Temperature measuring circuits may be arranged to calculate the sum, difference and ratio of temperature. Calculated results are recorded directly.

Flexible Hydraulic Hose

The United States Rubber Company, Rockefeller Center, New York, N. Y., has announced a flexible hydraulic hose for use with hydraulic barkers. It is a one and one-half inch hose that is braided with wire and specially fabricated to withstand tremendous pressure. The hose flexed a million times in laboratory tests.

Sensitive Scale for Rapid Weighings

Toledo Scale Company, Telegraph Road, Toledo 12, Ohio, has announced *Model 9190* scale for use as a general purpose scale or for specialized weighing problems. The scale is available for weighing either in grams or grains, and has a capacity of 1,500 grains. Graduations are as fine as two grains, or 0.2 gram. The over-all dimensions of the scale are 15¾ in. by 14½ in.

As an example of one of its specialized applications in the paper industry, the scale

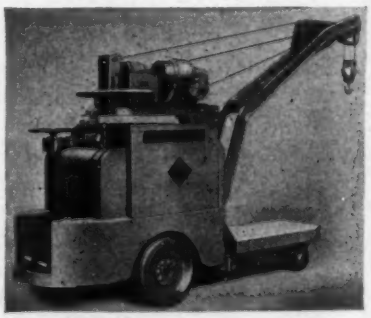
may be used for ream weight determinations. For this application, the scale is equipped with special holder and with a chart graduated to show ream weights.

Rapid action, durability and a wide choice of charts and equipment make the scale adaptable to a wide variety of weighing problems.

When desired, the scale is furnished with a carrying case.

Combination Crane Truck

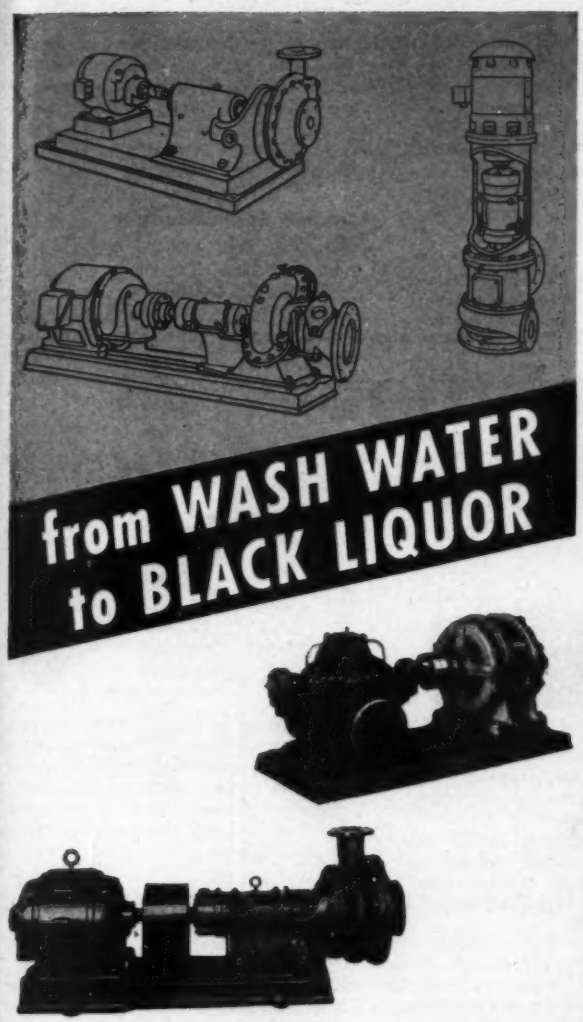
The Elwell-Parker Electric Company, 4205 St. Clair Ave., Cleveland 14, Ohio, has announced the *L-11C Combination Crane Truck*. This truck, utilizing a separate motor for raising and lowering the boom, serves as a lift-truck, a load carrier, crane



and tractor. The model has a capacity of 6,000 lb. on the platform, 2,000 lb. on the hook at 42 in. radius and 1,000 lb. on the hook at 84 in. radius. It will travel at six miles per hour with no load and five miles per hour with full load under normal conditions.

Water-Resistant Liquid Adhesive

A water-resistant liquid adhesive, designated as *V-Seal 27*, has been announced by Stein, Hall & Co., Inc., 285 Madison Ave., New York, N. Y. The product is supplied ready for use, and it may be diluted up to



You men in the pulp and paper industry don't have to be told how tough your liquid handling problems are. And many of you know too, that Goulds Pumps stand up under the punishing service in pulp and paper making like no other pumps do.

Whether it is for handling large quantities of wash water or corrosive black liquor in the sulphate mill, for lime water or sulphurous acid in the sulphite mill, or for 6% stock to the beater, there is a Goulds Pump for that particular job.

Goulds engineers have been working with pulp and paper makers for years in developing pumps to fit their needs and to give them long, dependable trouble free performance. Specializing in pump building for nearly a century has given Goulds the experience and the facilities to provide the many different pumps for the varied duties in the pulp and paper field.

For your postwar requirements you can continue to call on Goulds for the pump for the job.

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Keeping oil clean pays big dividends in reduced maintenance and increased production in the operation of Turbines, Internal Combustion Engines, Hydraulics, Machine Tools, Compressors and other industrial equipment. Put this Honan-Crane Oil Purification Engineer to work on your problem—he will be one of the most important men in your plant. A Honan-Crane Engineer will call at your convenience. Write today.

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20 per cent with water, depending on the application. It is suggested by the manufacturer as a bag seam gum and as a specialty adhesive for sealing asphalt paper used for wrapping parts for overseas shipments — also for other applications which require a tacky, water-resistant adhesive.

The adhesive, according to the announcement, has been approved by the Corps of Engineers as a seam gum on bags used for shipping Army goods overseas — it also meets Army specification 100-14A for types C, L and M paper, and specification A X S 1074 for both grade A and grade B types of adhesive.

Fastener for V-belts

A fastener for the smaller sizes of V-belts, designated as *Flex V*, has been developed by the Flexible Steel Lacing Company, 4607 Lexington St., Chicago 44, Ill. The fastener consists of two V-shaped end plates, an alloy metal hinge pin and self-tapping screws for fastening the end plates to the belt ends.

A simple applicator is used to prepare the belt ends, place and align the end plates and hold the screws upright during the actual fastening process.

The separable hinge joint permits replacement of V-belts without dismantling line shafting or machinery. With no metal on the underside of the belt, a belt can also be run on a V-flat drive.

Eye Shield

A shield for protecting the eyes and face, known as Type J-1, has been announced by Jackson Products, 3265 Wight St., Detroit 7, Michigan.

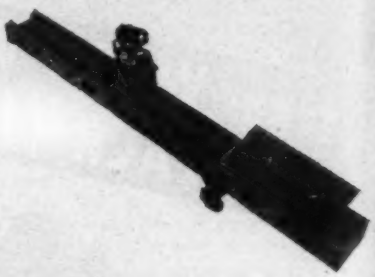
Among the features of the shield as cited by the manufacturer are the following: featherweight, sliding fibre head strap; leather sweat band, fibre spark deflector, and a flexible and adjustable snap-on visor in either a clear, light, medium, or dark green shade.

One Gallon Autoclave

Industrial Machinery Company, Bloomfield, N. J., has announced the resumption of manufacture of its Alberger one gallon autoclave in iron, stainless steel, or Monel metal. According to the manufacturer, the autoclave is especially suitable for digestion operations and for other pressure (up to 1000 lb.) and temperature research. The unit is complete with jacket, stirrer equipment, safety valve, gauge, etc.

Portable Belt Conveyor

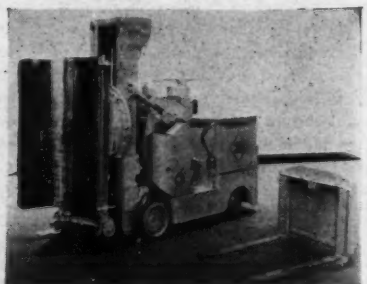
A portable belt conveyor, designated as the *Tote-All* conveyor, has been announced by the Tote-All Division, Coaltoter Conveyor Co. (Not Inc.), 310 S. Michigan Ave., Chicago 4, Illinois. Available in two lengths (13 ft. 9 in. and 20 ft.) and with a belt 10 in. wide, the conveyor comes equipped with either a 1½ hp. or 2.3 hp.



gasoline engine or without power unit for motor drive application. Engine mounting on models equipped with gasoline engine is adjustable to keep engine level regardless of angle of conveyor. Normal belt speed is 420 fpm. Variable speed drive pulley is available if desired.

Power Trucks with Interchangeable Load Handling Attachments

Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio, has announced the development of a line of power trucks with interchangeable load handling attachments. The illustration shows a type F-15 truck built for paper mill or printing plant use. Equipped with a roll handling scoop, this truck can pick up, carry, and stack rolls of paper. The rolls can be carried in either horizontal or vertical positions.



Only a few minutes are required to remove the scoop and to attach a fork. Then the truck can be used for handling and hauling flat stock on skids or pallets, or for handling bales of raw materials. If desired, the fork can also be used for handling rolls; however, the scoop attachment is generally preferable.

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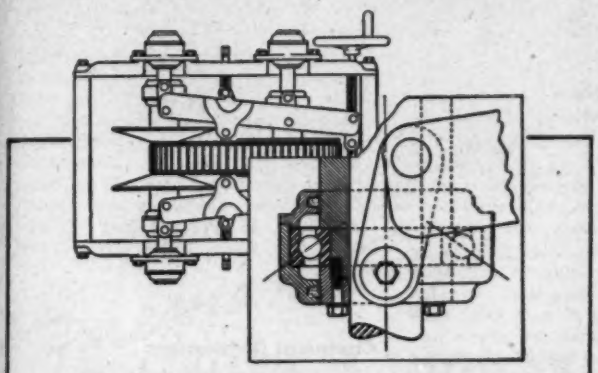

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Australian Pulp

The recent discussion on the use of eucalyptus woods in pulping is continued (The reader is referred to THE PAPER INDUSTRY AND PAPER WORLD, 26, No. 9, 1224, 1944). The author gives experiences at the Maryvale, Victoria mill, and refers to the manufacture of bleached, semi-bleached and unbleached kraft. Because they have a high xylan content, the pulps respond well to beating, and good formation and excellent finish can be obtained without sacrifice of strength. Kraft furnishes with 70-75% eucalyptus could be run at machine speeds of 1,000 feet per minute. Standard bursting strengths could be obtained with somewhat special treatment. By separately underbeating the longer fibered fraction and overbeating the (main) short fibered portion of the pulp, a suitable tear of the unbleached pulp is obtained. It is advantageous to use the most suitable longer fibered pulps. With bleached and semibleached pulps, combined beating is feasible. Although these pulps may not compete with the Scandinavian krafts, further experimentation is certainly justified. R. H. Dixon, Paper-Maker, 108, No. 4, 165 (1944).

Modern Lancashire Boiler Plants

After giving a historical review, the author presents tabulated data on the performance of modern Lancashire plants. High outputs may be obtained with high efficiency (an over-all efficiency of 84.7% with a boiler of 30 ft. x 8½ ft., using a sprinkling stoker). Settings (and their shortcomings), economizers, superheaters, induced and forced draft, and combustion equipment are discussed at some length, and quite critically from the standpoint of the operating engineer. Miscellaneous items like water treatment, auxiliary instruments, etc., are treated very briefly. The author concludes that, whereas, for large steam loads, like 60,000 lb. per hr., a single watertube boiler would be much cheaper than a group of (4) Lancashire boilers, the latter would show advantages when a spare boiler is required, because the installation of a 5th boiler would entail only a 20% greater cost, whereas a spare 60,000 lb./hr. watertube boiler would double the cost. The article is not illustrated. A. F. Webber, Papermaker and British Paper Trade J. 107, No. 3, TS. 24-31 (1944).

Bleaching of Jute

Details are given for the bleaching of jute materials without causing undue loss of strength or weight. For mild bleaching, cold or warm (alkaline) hypochlorite solutions are used. Cold alkaline permanganate followed by bisulphite also gave reasonably satisfactory results. A hot peroxide bleach may be given, after the jute has been subjected to the alkaline hypochlorite treatment, but for uniformity it was found best to scout the material with an aqueous soda ash solution (using 7.5% of the chemical on the weight of the jute) and to treat at 65-75 deg. The scouring bath is improved by the addition of small amounts of peroxide. Only when practically all lignin is removed is nearly white jute obtainable. This, however, seriously reduces strength. B. P. Ridge and A. H. Little. J. Textile Inst. 35, No. 1, 121-135 (1944).

Identification of New Fibers in Rag Cuttings

Difficulties have arisen as a result of various synthetic fibers and waterproofing finishes, etc., in rags used for papermaking. The rag room foreman, therefore, needs a rapid test which will tell him whether the fiber is cotton and whether it can be used in papermaking. A simplified scheme of analysis is suggested. It only involves two tests: the effect of flame and the action of a solution of phenol in acetone. Any fiber or fabric that burns with the formation of a melted lump (or which simply melts without burning, or is entirely flame-resistant) is pretty sure to be unfit for papermaking. Any fiber that is soluble in (or softens in) the phenol-reagent is also probably an unsatisfactory papermaking material. For identifying regenerated cellulose (viscose and cupramonium), the suggestion is made to strain with Texchrome rather than Brilliant Blue 6BA (as recommended by the American Association of Textile Colorists and Chemists). The identification of waterproofing or other chemical treatments is complex and not very satisfactory. By and large it is a matter of the alertness and experience of the rag room personnel, who can spot special finishes by appearance and handle. The author also includes a chart outlining tests recommended by the AATCC for synthetic fiber identification, and some of the tests used by the laboratory of Crane and Co. are outlined (by M. F. Lynch). F. L. Simons, Paper Mill News, 67, No. 51, 14, 16, 18 (Dec. 16, 1944), through B.I.P.C. 15, 159 (1945).

Paper-Base Plastics

Although the tensile strength of reinforced plastics increases with the amount of fibrous component added, this improvement is sharply limited by the need to fill all the voids in the paper. When the resin is not sufficient to fill all the air spaces, the strength of the material is greatly decreased. The chief function of the application of pressure during the bonding process is to reduce the voids. Provided a sufficiently dense paper is used, fairly strong boards can be produced with pressures as low as 250 lb. per square inch. The effect of uneven distribution of pressure is discussed and the beneficial effect of semi-flexible platens is illustrated. Variations in the manufacturing conditions are shown to have an important effect upon the resistance of paper base plastics to water. It is demonstrated that conditions giving rise to the highest values of Young's modulus result in products having minimal superficial dimensional movement.

The authors thus give experimental data on the effect of resin content on mechanical properties, the effect of pressure, the interdependence of pressure and resin content, the effect of air spaces on the mechanical properties, the effect of uniformity of pressure, and the dimensional stability of paper base plastics. The effect of manufacturing conditions on paper-base plastics also received attention.

In a well-illustrated appendix, detailed methods are given for testing laminated boards. These include tests for the usual mechanical properties as well as tests for "brittleness." The present article, which is illustrated by means of graphs, is an extension of earlier work of the same authors. (J. Soc. Chem. Industry, 60, 150 (1944)). K. W. Pepper and F. T. Barwell. J. Soc. Chem. Industry Nov. 1944, 321-9.

◆

Chemical Defoamers . . .

(Continued from page 1684)

really controls the foam without in any way adversely affecting the qualities desired in the sheet being made. The foam killer cost per ton of product produced may be easily calculated during this extended trial period. It should be emphasized that in calculating cost, the foam killer cost per ton of paper or paperboard and not the cost per pound of foam killer should be used as a basis of determining cost figures.

Hard sized grades often present a particularly bad foam problem. Not only must a defoaming agent eliminate the froth generated by the rosin size but it must not in any way lessen the water repellency of the finished sheet. To the best of the author's knowledge, only one or possibly two materials are available today which may be added to a hard sized furnish and not only control any foam present but at the same time give more uniform sizing. One mill regularly using a product of this kind on a moderately sized sheet of paperboard experienced a complaint from a customer who found the sheet too water resistant. Investigation proved that an excessive amount of the agent was accidentally added and because of complete elimination of foam, sheet formation was so much improved that more uniform sizing was obtained. This in turn resulted in glueing difficulties in the folding carton plant. This is an unusual case; however, it serves to illustrate that the right defoamer is capable of improving sheet formation, if foam is the cause of poor formation.

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PAPERMAKING PATENTS

IN THE UNITED STATES—Compiled by James Atkins, Registered Patent Attorney

Inquiries should be addressed to James Atkins, Munsey Building, Washington 4, D. C.

Paper Drier and Method

Patent No. 2,344,686. John R. Fanselow, Appleton, Wis., assignor to Paper Patents Company, a corporation of Wisconsin. Application June 28, 1941, Serial No. 400,286. 4 Claims. (Cl. 34—18).

4. The method of continuously drying a wet paper web on a multiple roll drier of the class described to a predetermined moisture content which is uniform across the width of the web and which is within the range of from about 4 to 10 per cent by weight, which comprises rapidly reducing the moisture content of the web to a point where the driest portion thereof contains not less than about 12 per cent by weight of moisture by passing the web over a number of the drying cylinders of the drier to which heat energy is supplied at a high rate, and then slowly reducing the remaining moisture content of the web to said predetermined, uniform value by passing the web over additional drying cylinders, to which heat energy is supplied at a much lower rate than that at which heat energy is supplied to said first mentioned drying cylinders, while simultaneously subjecting the web to a conditioned atmosphere, the temperature of said additional drying cylinders and the temperature and humidity of said conditioned atmosphere being so correlated that equilibrium conditions will be achieved in said web when the moisture content thereof is at said predetermined value, there being sufficient cylinders in said last mentioned group and the rate at which heat energy is supplied thereto being such as to assure that the web shall attain said equilibrium condition in all parts thereof.

Paper Stock Flow Valve Regulating Mechanism

Patent No. 2,339,730. John Warren Vedder, Worcester, and Everett W. Clem, Shrewsbury, Mass., assignors to Rice Barton Corporation, Worcester, Mass., a corporation of Massachusetts. Application January 20, 1942, Serial No. 427,472. 10 Claims. (Cl. 92—43).

1. In a paper making machine having a movable wire screen on which a paper web is laid, a pulp stock flow controlling mechanism comprising walls forming a conduit which is substantially as wide as the width of the screen and is arranged to cause the paper stock to flow directly to the screen in a stream of substantially uniform width, a valve and associated valve seats at the entrance to said conduit which are substantially as long as is the width of said screen, one of said parts being flexible, and means for causing relative movement of the valve and seats to open and close the valve passage and for flexing said flexible valve part so as to provide a localized control of the passage of the stock.

Coating Process

Patent No. 2,333,629. Warren E. Beadle, Sr., Wisconsin Rapids, Wis., assignor to Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., a corporation of Wisconsin. Application July 14, 1941, Serial No. 402,302. 4 Claims. (Cl. 117—111).

1. A method of coating a continuously advancing relatively flexible fibrous web which comprises, depositing a controlled amount of mobile coating material upon a rotating surface, rotating said surface in contact with an unsupported surface of said web and in the same direction of movement with said web and at a speed less than the translatory speed of said web to apply a coating to said web surface with a wiping action, and subsequently passing said web between opposed pressure surfaces while the coating material upon the web is in a mobile state to only thereafter compact said coating material upon said web surface, and drying said coated surface.

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New Catalogues and Publications

American Car and Foundry Company, Valve Department, 30 Church Street, New York 8, N. Y.—Of special interest to paper mills is the revised eight-page bulletin CC-5M-145 just issued by this company, showing the advantages of its a.c.f. full pipe-area lubricated plug valves as a mechanical means of regulating the flow of fluids in pipe lines. Diagrams, photos, cross-section views, and tables with helpful information on valves, lubricants and wrenches add to the value of the booklet.

American-Marietta Company, 43 East Ohio Street, Chicago 11, Ill.—Sent free of charge to management and maintenance men is a handy new wartime paint guide, which selects the best paint for a given application without detailed technical knowledge of different finishes., Of convenient pocket size, it works on the principle of a slide rule, and with only two settings gives the correct surface preparation, the proper priming and finishing coats. Information is furnished as to the resistance of the recommended material to heat; acid, alkali; moisture; abrasion; sun and oil. Coverage and drying time are also included, as well as the proper thinner and the correct preparation.

Automatic Transportation Company, 101 West 87th Street, Chicago 20, Ill.—Now under preparation by this company is its 1945 series of material handling bulletins, Numbers 1 to 10. Each bulletin consists of four to six pages of pictures and text dealing with actual operating methods, and is based on plant interviews and the study of methods. The bulletins are useful to manufacturers and distributors in all lines of business, especially to those planning postwar operations. Of particular interest in the series are Bulletin No. 4, "Concrete Block Handling Simplified;" Bulletin No. 5, comparing operations of pallet lift trucks with fork trucks; Bulletin No. 6, on training personnel; Bulletin No. 7, covering mechanical handling personnel, safety, maintenance, design of buildings and machines; Bulletin No. 8, "46% Savings in Industrial Handling Costs," dealing with the manufacturing of electrical equipment; Bulletin No. 9, a personnel bulletin showing how training and skill pay dividends; Bulletin No. 10, which takes up operating kinks and shows how to get out of tight spots with pallet trucks and fork lift trucks. These bulletins will be sent periodically, three or four at a time, without charge, to all business firms by writing Edwin L. Bertram, manager, Sales Promotion, at above address.

Chain Belt Company, 1600 W. Bruce Street, Milwaukee 4, Wisconsin—A new Bulletin No. 462 is now available, describing Rex apron and pan feeders and conveyors, which are used for handling coal, coke, ore, cement, rock, chemicals, bulk parts and many other materials. Included are design details of aprons and pans, cross-sections and capacity tables to be used in designing conveyor systems, and specifications tabulated for quick comparison. The bulletin may be had by writing to the address above, or to the nearest branch office.

Crocker-Wheeler Division, Joshua Hendy Iron Works, Ampere, N. J.—A four-page bulletin just issued by this company describes and illustrates a new protected-type motor, for both drip-proof and open motor applications. The various design features of the motor are illustrated in a cutaway view, showing how its construction provides protection against the most common hazards encountered in operation. Principal applications are also pointed out in the text and illustrations.

Denver Equipment Company, P. O. Box 5268, Denver 17, Colo.—Just issued by this company is Bulletin C5C-B, describing its cross-flow classifier. Striking illustrations in red and black, together with photos, give full information about the machine. Included is data sheet in duplicate for information necessary to select classifier.

The Jeffrey Manufacturing Company, Columbus 16, Ohio—A new 40-page catalogue covering its complete line of crushing equipment for all mines and industries using coal is available by writing Crusher Division, The Jeffrey Manufacturing Company, Columbus 16, Ohio. Types, sizes, capacities, space required and complete range of product sizes are included.

Link-Belt Company, 307 North Michigan Avenue, Chicago, Ill.—A new, eight-page illustrated Book No. 2045 is announced by the Link-Belt Company, covering a complete line of shaft couplings. Sizes, dimensions, and list prices are included for couplings of flexible, rigid flanged face and compression types, with emphasis on the Type "RC" roller chain bearings. Complete information is also given on protective casings for the "RC" coupling. A copy may be obtained by writing to any of the Link-Belt Company offices.

The Noble and Wood Machine Company, Hoosick Falls, N. Y.—Of special interest in these days of manpower shortage, is the "E-Z" portable loader for putting pulp wood on trucks described in the circular just issued by the above company. Booklet will be sent on request.

Sandy Hill Iron and Brass Works, Hudson Falls, N. Y.—Two new broadsides have just been issued by this company. The one describing their selective drive is illustrated with photos, blueprints and diagrams. It emphasizes the advantages of this drive in operation, economy and safety. The other explains the operation of the Kamyr Wet Machine, which may be had with electric or parallel drive. Layouts are given for both applications, as well as a general layout of air and water removal from the Kamyr cylinder mould.

U. S. Stoneware Company, Process Equipment Div., Akron 9, Ohio—Available on request is a new bulletin No. 405 describing storage and mixing equipment for acids and corrosive materials. In addition to illustrations of the tanks, jars, pots and trays, there are tables of dimensions.

Books

Formaldehyde—Written by J. Frederic Walker, Chemical Research Division, Electrochemicals Department, E. I. du Pont de Nemours & Company, Inc., this volume, one of the American Chemical Society Monograph Series, has been presented in the hope of filling a definite need for a systematic and critical account of formaldehyde chemistry. The author discusses formaldehyde production, commercial formaldehyde solutions, chemical properties of formaldehyde, reactions of formaldehydes with various chemicals, detection and estimation of small quantities of formaldehyde, uses of formaldehyde, as well as several other phases of the subject. The book totals about 400 pages. It contains both an author and a subject index. The price is $5.50 a copy; the publisher, Reinhold Publishing Corporation, 330 W. 42nd St., New York 18, N. Y.

The Paper Makers' Directory of All Nations (1944)—Now in its fifty-third edition, this book, as indicated by its title, lists the pulp and paper mills of the world. The mill listings first cover England and Wales, Ireland and Scotland, and then foreign countries and British dominions and colonies. The countries in this latter listing are arranged alphabetically, beginning with Algeria and ending with Yugoslavia. Firm names also are presented alphabetically. In addition to mill listings, the book includes other extensive data common to a publication of this kind. For example, there is a listing of agents and mill representatives in England, Ireland, and Scotland; a listing of British Paper Trade Associations; a listing of Bag Makers in England, Ireland, and Scotland, etc. The price of the book is 25/- net; the office of the Directory is 30 Bedford Street, Strand, London, W. C. 2, England.

Plastics Catalog (The 1945 Encyclopedia of Plastics)—Keynote of this volume of 1200 plus pages is the statement in the introductory section "Fifty years of progress telescoped into the past five years establishes a record of which any industry may well be proud." The book details hundreds of wartime applications of plastic materials. A gallery of natural color photographs shows the many plastics articles — novelties, bathroom accessories, shower curtains, vacuum cleaners, chess sets—which were available to the civilian public before the war.

A number of new postwar designs from the drawing boards of leading designers in the plastics industry form an important colorful section of the volume. Detailed information also is included on war applications.

An innovation in this book is industry statistical information. There also appears the first over-all price list of plastics and a section detailing A.S.-T.M. standards.

There likewise are new articles on silicones, polectron, polyethylene, furane resins and resorcin-formaldehyde resins. Other important additions include articles on engineering design and plastics models.

Previously published articles have been revised and brought up to date. Then, too, there are inserts of ten charts: namely, plastics identification, plastics properties, chemical formulae, plastic materials manufacture (flow charts), solvents, adhesives, plasticizers, plastics used in liquid coatings, and synthetic rubber.

A directory section contains information on all branches of the plastics industry including educational institutions, molders, material manufacturers, trade names, etc.

The price of the book is $6.00 a copy; the publisher is Plastics Catalogue Corporation, 122 East 42nd Street, New York, 17, N. Y.

Practical Psychology—This book has been written for people with little or no previous contact with the usual psychology course. The aim of the author has been to survey the chief problems in which the applied psychologist has made some contribution. The text treats of the application of psychology to education, mental health, industry, consumers and advertising, crime, and personal problems. In the portion of the text covering the application of psychology to industry, consideration is given to employment psychology, training in industry, efficiency in production, morale and rewards for work, and industrial and highway accidents. The section covering application of psychology to personal problems treats of vocational guidance and effective speaking and writing. Written by F. K. Berrien, Assistant Professor of Psychology, Colgate University, and published by The MacMillan Company, 60 Fifth Avenue, New York 11, New York, this book is priced at $4.00 a copy.

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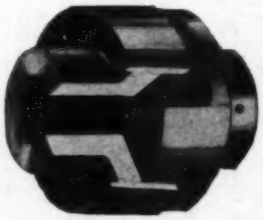

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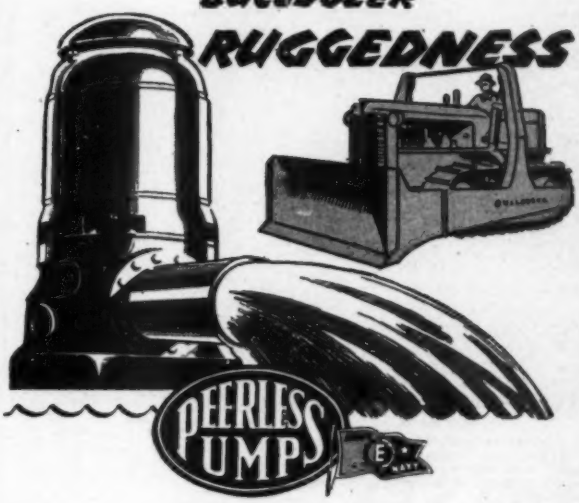

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Peerless Distributors and Direct Factory Representatives are located in every State.

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CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

OPA ceiling prices in sales to consuming mills delivered buyer's usual receiving point, with brokers' allowance not in excess of 5 per cent.

	per cwt.
Blue Overalls	-5.50
Corduroy, Men's	-3.50
Corduroy, Ladies'	-3.00
Washables, No. 1	-3.00
Percales	-4.75
New Soft Blacks	-3.75
Light Prints, No. 1	-4.50
Khaki Cuttings—	
Bleachable	-4.25
Unbleachable	-3.50
New White Canvas	-6.50
New Mixed Blacks	-3.25
Canton Flannels, Bleached	-7.00
Shirt Cuttings—	
New White No. 1	-7.25
No. 1 White Headings	-7.25
White Shrunk	-5.00
Silesias No. 1	-5.75
New Unbleached	-7.50
Fancy	-3.50
Linen Cuttings—	
American	-5.00
White	-14.00
Grey	-14.00

RAGS (Domestic)

f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowance of $1 to $2 a ton depending on the value of the grade involved.

	per ton
Roofing—	
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
Whites, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shoppers	

ROPE and BAGGING

f. o. b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	2.75 to 3.00
Wool Tares—	
Light	3.25 to 3.50
Heavy	3.50 to 3.75
No. 1 Scrap Bagging	2.60 to 2.85
Manila Rope—	
No. 1 large	-*115.00
No. 1 small	-*105.00
Sisal Rope—	
No. 1 large	-*95.00
No. 1 small	-*80.00
New Burlap Cuttings	5.50 to 6.00
Jute Threads—	
Foreign (Nom.)	6.25 to 6.50
Domestic	5.50 to 5.75
Strings—	
No. 1 sisal	-*80.00
No. 2 sisal	-*60.00
Soft jute	5.00 to 5.50
Mixed	1.75 to 2.00

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices f. o. b. points of shipment for machine compressed bales weighing not less than 500 pounds (with differential of $5 per ton less on certain grades for loose or bundled stock), and brokers' allowance of 4 to 9 per cent.

	per ton
Shavings—	
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, No. 1	57.50-
Soft White, No. 1	50.00-
Soft White, One-Cut	57.50-
Soft White, Misc.	43.00-
Fly Leaf, No. 1	33.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	18.00-
Flat Stock—	
No. 1 Heavy Books and Magazines	38.50-
Mixed Books	22.00-
Ledger Stock—	
No. 1 White	46.00-
No. 1 Mixed (Colored)	40.00-
Manilas—	
New Env. Cuttings	53.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	39.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Ground Wood Manila Tab Cards	27.00-
Kraft—	
Envelope Cuttings	65.00-
Mixed Env. or Bag Cuts	55.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cor. Cuts	45.00-
No. 1 Old Assorted	35.00-
News—	
White Blank	33.00-
Overissue	22.00-
No. 1 Baled	20.00-
Old Corrugated Containers	28.00-
New Corrugated Cuts	18.00-
Mill Wrappers	22.00-
Box Board Chips	14.50-
No. 1 Mixed Paper	19.00-

CHEMICALS

f. o b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to —
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	22.00 to 24.00
80-100 mesh (bags), lb.	—
Argentine, lb	17.50 to 18.50
China Clay—	
Domestic Filler Bulk (mine) ton	7.50 to 15.00
Domestic Coating Bulk (mine) ton	11.00 to 22.00
Imported (ship side) Bulk (lump) ton	14.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.75
Litharge, powd., bbl., lb.	.09 to —
Rosin (Gum)—	
New York, per 100 lbs.	
E	6.75—
F	6.85—
G	7.00—
WW	8.00—
Rosin (Wood), carlots	4.50-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	20.00 to —
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.65 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30-
Ground and flake, drums, cwt.	2.70 to 2.95
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.72-
Pearl, barrels, cwt.	3.83-
Paper (Sp.) bags, cwt.	3.83-
barrels, cwt.	3.92-
Sulphur (Crude)—	
(Min) bulk, long ton	16.00 to —
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 21.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	5.60 to 5.85

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo. (West of the Continental Divide and in Denver, Colo., ceilings are $6 per ton lower):

Bleached softwood sulphite	86.00
Unbleached softwood sulphite	74.00
Bleached hardwood sulphite	83.50
Unbleached hardwood sulphite	71.50
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Northern unbleached sulphate	73.00
Southern unbleached sulphate	63.50
Bleached soda	76.00
Unbleached soda	72.00
Ground wood pulp	50.00
Ground wood—paper machine dried and mutilated	53.00
Sulphite screenings	43.50
Sulphate screenings	38.00
Ground wood screenings	32.00
Northern unbleached sulphate siderums	73.00
Southern unbleached sulphate siderums	63.50
Standard news print siderums	59.00

PAPER

f. o. b. New York City

	per ton
Boards—	
Binders	84.00-
Chip	50.00-
Chip, tube and can	52.00-
Chip, full-blending	54.50-
Chip, sgl. mla. lined	62.00-
Coated, white patent .016	90.00-
.020 and heavier	75.00-
Kraft liner	63.00-
News	50.00-

Book Papers—OPA base maximum prices per cwt. 4 cases or equivalent, f. o. b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	8.25
B Grade E. F.	7.80
C Grade E. F.	7.55
D Grade E. F.	7.30
E Grade E. F.	7.05
No. 2 Uncoated Offset 4 sides. White Coated White (Trimmed 4 sides)	8.45
No. 1 Glossy	11.90
No. 2 Glossy	10.85
No. 3 Glossy	10.15
No. 4 Glossy	9.80
No. 5 Glossy	9.30
C2S Offset	10.40
C1S Litho (Varnish)	10.05
C1S Litho (Non-Varnish)	9.80

Writing Papers—OPA base maximum prices per cwt. on writing papers, f. o. b. mill with none, quantity, packing and other differentials allowed:

Rag Content Bond—	per cwt. 20 lb.	16 lb.
Extra 100% Rag	34.00	34.00
100% Rag	28.00	28.00
75% Rag	20.00	20.00
50% Rag	16.00	17.25
25% Rag	14.00	15.00

Rag Content Ledger—	per cwt. Zone 1
Extra 100% Rag	35.00
100% Rag	29.00
85% Rag	26.00
75% Rag	21.00
50% Rag	17.00
25% Rag	15.00

Sulphite Bond—	per cwt. 20 lb.	16 lb.
Air dry, watermarked	12.75	13.70
No. 1 (M. F.) watermarked	9.00	9.70
No. 2 (M. F.) watermarked	8.25	8.85
Plain (M. F.) unwatermarked	7.60	8.20

Sulphite Ledger—	per cwt. Zone 1
No. 1 (M. F.) watermarked	10.00
No. 2 (M. F.) watermarked	9.25
Plain (M. F.) unwatermarked	8.60

Glassine (f. o. b. mill)—	per cwt.
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.50
Unbleach. (25 lb. up)	10.00 to 10.50

News—OPA Ceilings—	per ton
Rolls, Standard (Contract)	58.00
Rolls, Lightweight (Cont.)	62.00
Rolls (Spot)	(Nominal)
Sheets	66.00

Tissues (Carlots)—	per ream
White, No. 1	1.12½ to 1.20
White No. 2	.90 to 1.00
Bleached Anti-Tarnish	1.15 to 1.20
Colored	—
Anti-Tarnish Kraft	.70-
Manila	.90 to .95
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.09-
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.60-
Toilet, Bleached (M shts.) per cs.	5.65-
Toilet, Unbleached (M shts.) per cs.	4.25-

Towels—	per case
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.95

Wrappings (Kraft)—	per cwt.
Super-Standard	5.25 to 7.65
No. 1 Wrapping	5.00 to 7.40
Standard Wrapping	4.75 to 7.15
Standard Bag	4.37½

Wrappings (Sulphite and Bleached Kraft)—

(Rolls, f. o. b. mill)

Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 40 lb.	5.50 to 5.75

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.50
Envp. Mla., Sub. 16-28 (No. 2)	5.75 to 6.00
Envp. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M.G. Sulphite and Kraft (other than Waxing)	
Grade A-22 lb.	7.20 to 7.40
Grade B-20 lb.	6.75 to 7.00

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The massive precise castings you see above are the secret of the GK Knife Grinder's day in—day out durability—the real reason why it stands up under gruelling production schedules hour after hour, without dropping a hairline in accuracy! Knives are held firmly and immovably on the GK—there's no chance of a poor grinding job, due to vibration or chatter.

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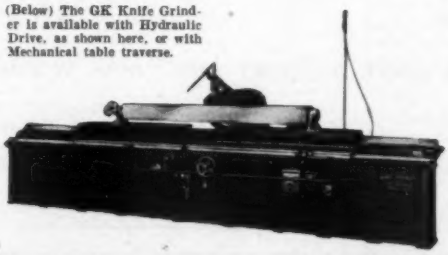

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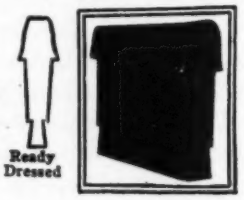

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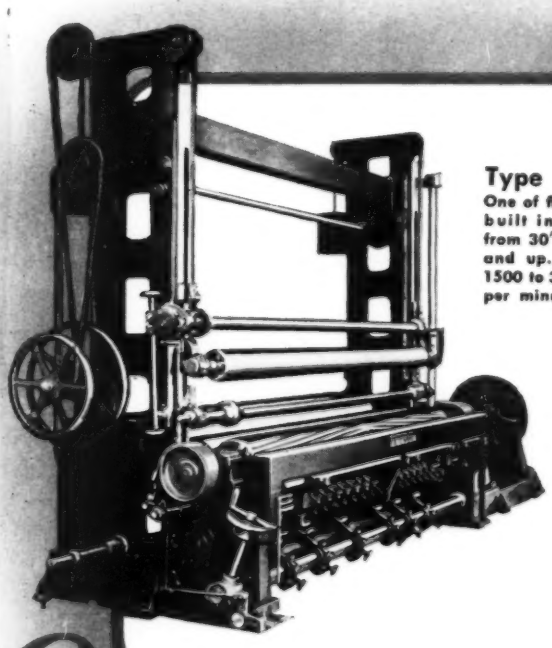

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